Accounting and Business Research

Investor reactions to corporate environmental saints and sinners: an experimental analysis

Financial analysis, future earnings and cash flows, and the prediction of stock returns: evidence for the UK

Cross-sectional estimation of abnormal accruals using quarterly and annual data: effectiveness in detecting event-specific earnings management

Share price anticipation of earnings and management's discussion of operations and financing

Corporate governance: from accountability to enterprise

[illegible]
[illegible]
[illegible]

Accounting and Business Research

Editor:
K. V. Peasnell, Lancaster University

Associate Editors:
M. Ezzamel, University of Manchester
P. Moizer, University of Leeds

Editorial Board

S. Archer, University of Surrey
D. Ashton, University of Bristol
M. Barth, Stanford University
R. H. Berry, University of Nottingham
M. Bromwich, London School of Economics
P. Brown, University of Western Australia
S. Carmona, University of Madrid
R. H. Chenhall, Monash University
C. W. Chow, San Diego State University
G. Clinch, University of New South Wales
T. E. Cooke, University of Exeter
D. Cooper, University of Alberta
P. Easton, Ohio State University
J. R. Edwards, University of Wales, Cardiff
C. Emmanuel, University of Glasgow
M. Firth, Hong Kong Polytechnic University
J. Flower, Centre for Research in European Accounting, EIASM
D. Hatherly, University of Edinburgh
R. E. Jensen, Trinity University
K. Keasey, University of Leeds
I. Lapsley, University of Edinburgh
T. A. Lee, University of Alabama
R. Macve, University of Wales, Aberystwyth
C. Napier, University of Southampton
C. W. Nobes, University of Reading
J. O'Hanlon, University of Lancaster
D. Owen, University of Sheffield
M. J. Page, University of Portsmouth
R. H. Parker, University of Exeter
R. H. Pike, University of Bradford
M. Power, London School of Economics
W. Rees, University of Glasgow
L. Revsine, Northwestern University
M. Shields, Michigan State University
D. Simunic, University of British Columbia
L. C. L. Skerratt, Brunel University
I. Solomon, University of Illinois
B. Spicer, University of Auckland
A. Steele, University of Warwick
N. Strong, University of Manchester
D. B. Thornton, Queen's University, Canada
M. Walker, University of Manchester
R. S. O. Wallace, King Fahd University of Petroleum & Minerals
W. Wallace, College of William & Mary, Virginia
G. P. Whittred, University of New South Wales
J. Wild, University of Wisconsin-Madison
S. A. Zeff, Rice University
I. Zimmer, University of Queensland

Editorial Office
K. V. Peasnell, Management School, Lancaster University, Lancaster, LA1 4YX, UK
Tel: 01524 593977. Fax: 01524 594334. E-mail: k.peasnell@lancaster.ac.uk

Advertisement and Subscription Office:
40 Bernard Street, London WC1N 1LD, UK. Tel: 0171 833 3291. Fax: 0171 833 2085
E-mail: postmaster@theabg.demon.co.uk Internet: http://www.accountancymag.co.uk

The Institute of Chartered Accountants in England and Wales

Incorporated by Royal Charter, 11 May 1880

Institute Offices and Library:
Chartered Accountants' Hall, Moorgate Place, London EC24 6EQ. Tel: 0171 920 8100

The views expressed in Accounting and Business Research are not necessarily shared by the Council of the Institute of Chartered Accountants in England and Wales. Articles in Accounting and Business Research are published without responsibility on the part of publishers or authors for loss occasioned to any person acting or refraining from action as a result of any view expressed therein.

© 1999 The Institute of Chartered Accountants in England and Wales.

ISSN 0001-4788

30

657.05
AE27B

Accounting and Business Research

Volume 29 Number 4 Autumn 1999

Contents

Articles

Investor reactions to corporate environmental saints and sinners: an experimental analysis	Christian C. Chang Markus J. Milne	265
Financial analysis, future earnings and cash flows, and the prediction of stock returns: evidence for the UK	Andreas Charitou George Panagiotides	281
Cross-sectional estimation of abnormal accruals using quarterly and annual data: effectiveness in detecting event-specific earnings management	Debra C. Jeter Lakshmanan Shivakumar	299
Share price anticipation of earnings and management's discussion of operations and financing	Thomas Schleicher Martin Walker	321

Commentary

Corporate governance: from accountability to enterprise	Helen Short Kevin Keasey Mike Wright Alison Hull	337

Book Reviews

George P. Baker and George David Smith, *The New Financial Capitalists: Kohlberg, Kravis and Roberts and the Creation of Corporate Value*	Mike Wright	353
Niamh Brennan, *Disclosure of Profit Forecasts During Takeovers: Evidence from Directors and Advisors*	B. A. Rutherford	354
Pauline Weetman and Aileen Beattie (eds), *Corporate Communications: Views of Institutional Investors and Lenders* Vivian Beattie (ed.), *Business Reporting: The Inevitable Change?*	Michael J. Jones	355
Claire Marston, *Investor Relations Meetings: Views of Companies, Institutional Investors and Analysts*	Andrew Higson	357

Forthcoming Articles

Simon Hussain, Simultaneous determination of UK analyst following and institutional ownership

Paul Mather, Financial covenants and related contracting processes in the Australian private debt market: an experimental study

Thomas Plenborg, An examination of the information content of Danish earnings and cash flows

Gregory Shailer, The relevance of owner-manager signals and risk proxies to the pricing of bank loans

657.05
AC 27 B

Objective of Accounting and Business Research

The objective of *Accounting and Business Research* is the publication of substantial and original contributions to knowledge in the areas of accounting broadly defined. Articles should be empirical or analytical; rigorous, yet preferably intelligible to a wide audience of academics and, where appropriate, practitioners. Presentation should be as elegant and economical as possible, avoiding unnecessary words, numbers or symbols.

Book Reviews

Books for review should be sent to the editor.

Subscription Rates

	UK	Overseas Airmail
Individual	£40	£45
Corporate/institutional	£120	£130

All subscriptions may be paid in US dollars at current rates of exchange. Payment for individual subscriptions must be by personal cheque or credit card.

Bound Volumes

Bound volumes with index of Volume 8 1977–78 onwards are available from the Subscriptions Manager. Subscribers wishing to have their own copies bound should address their enquiries to Messrs. George Woodhead and Co., 1 Gloucester Street, Manchester M1 5GP, England. Microfilmed copies of back numbers are available from Microfilm Ltd., East Ardsley, Wakefield, West Yorkshire WF3 2AT.

Copyright/ Reproduction Policy

© 1999 The Institute of Chartered Accountants in England and Wales. All rights reserved. Apart from fair dealing for the purposes of research or private study, or criticism or review, as permitted by the Copyright, Designs and Patents Act 1988, this publication or any part thereof may not be reproduced, stored or transmitted in any form or by any means without the prior permission in writing of the Publisher, *Accounting and Business Research*, The Institute of Chartered Accountants in England and Wales, 40 Bernard Street, London WC1N 1LD. Except that (a) for courses of instruction articles in this issue of *Accounting and Business Research* may be copied without charge provided that the source and the Institute's copyright are indicated in such reproduction and (b) authors retain their personal right to re-use the material in future collections of their own work.

P 10,608

Investor reactions to corporate environmental saints and sinners: an experimental analysis

Christian C. C. Chan[+] and Markus J. Milne*

Abstract—Following Dierkes and Antal's (1985) model, this study examines the decision usefulness of narrative disclosures on firms' environmental performance by focusing on how investors allocate their investment funds. Using an experimental design, the study examines investors' reactions to two states of corporate environmental performance: one in which the company discloses it is performing badly with respect to the environment, and another in which the company discloses it is a leader in environmental management. The results indicate that investors, as expected, react strongly and negatively to the poor environmental performer, while somewhat less expected, there is no significant reaction to the better environmental performer. Sub-analyses, however, reveal 'environmental clientele' effects. For the poor environmental performer, investors who specifically mention environmental performance react even more strongly and negatively than those who make no mention of environmental performance. In the case of the better environmental performer, the reactions are more complex. For those investors who specifically mention the firm's environmental performance, two opposite reactions result. While one group positively invests in the company for its environmental leadership, the other group avoids investing in the company for what it appears to consider excessive and unnecessary expenditure. The results from this study are consistent with the widespread observation that firms will rarely disclose poor environmental performance unless required to do so. Moreover, the mixed reactions to the better environmental performer could also partly explain why firms appear willing to report their positive environmental achievements in only vague and general terms.

1. Introduction

Over recent years, the reporting of firms' impacts on the physical environment has dramatically increased (Gray et al., 1995; KPMG, 1997a). Concluding their 1996 International Survey of Environmental Reporting, KPMG state: 'Environmental issues are on the business agenda to stay, as illustrated by the fact that 71% of the companies mentioned environmental issues in their annual reports, compared to 58% in 1993.' Unlike financial reports, however, environmental disclosures are typically qualitative (narrative statements) (Gray et al., 1995; Deegan and Gordon, 1996; Hackston and Milne, 1996), and most go unverified by third parties, although this is now beginning to change in the UK and some Scandinavian countries (KPMG, 1997a). Most environmental (and social) disclosures made by companies also tend to portray firms in a positive light (Guthrie and Parker, 1990; Deegan and Gordon, 1996; Hackston and Milne, 1996), and in some cases may bear no relationship to other measures of the same events (Wiseman, 1982; Deegan and Rankin, 1996). This definite bias towards reporting positive news has led a number of observers to suggest such reporting may be little more than public relations exercises (Hines, 1991; Harte and Owen, 1992; Coopers & Lybrand, 1993; Greenpeace, 1993, 1996a).

Following Dierkes and Antal's (1985) model of social responsibility information usefulness, and utilising an experimental method, the purpose of this study is to investigate the potential impact of positive and negative environmental disclosures on investment decision-making. Groups such as investors, employees, suppliers, customers, government, and the community, it is argued, might find environmental and social information useful for their decisions and firms respond to these demands (see, for example, Ramanathan, 1976; Dierkes, 1979; Dierkes and Antal, 1985; Guthrie and Parker, 1990).

While recent surveys of shareholders' perceptions of environmental disclosures suggest a strong

---

*The authors would like to thank Drs Alan Macgregor, Kate Brown, Ken Moores and Ralph Adler for comments on earlier drafts. In addition, the authors express their appreciation to participants at seminars at Massey University, the Universities of Otago and Tasmania, and to two anonymous referees. All errors remain the responsibility of the authors. Correspondence on this paper should be addressed to Markus J. Milne, Department of Accountancy, University of Otago, P.O. Box 56, Dunedin, New Zealand. Fax: 64-3-4798450, Email: mmilne@commerce.otago.ac.nz

[+]Formerly a postgraduate student, Department of Accountancy, University of Otago.

This paper was accepted in April 1999.

demand for environmental information (see, for example, Epstein and Freedman, 1994; Goodwin et al., 1996; Deegan and Rankin, 1997), surveys have limitations. In particular, within a decision usefulness framework, demand for information by itself cannot provide an adequate basis on which to argue why and with what sort of information firms *should* respond, or to explain why firms *are* responding with certain disclosures. Dierkes and Antal (1985, 1986) suggest, 'The ultimate test for the usefulness of social [and environmental] reporting information [is] its impact on decision-making' (1985:30). To rely on decision-makers' claims for information could be faulty because of real inconsistencies in their attitudes and their behaviour. Decision-makers might not always use the information they claim to need, nor may they actually know whether it is useful—whether it makes a difference to their decisions.

Assessing the decision impact of accounting information is not new. Decision usefulness models have appeared in the literature since the 1960s (see, for example, Bruns, 1968; Sterling, 1972) and studies have examined the decision impacts of alternative inventory techniques, segmented data, tax allocation techniques, cash flow statements, and current cost accounting information.[1] Other than stock market reactions' studies, only Hendricks (1976) and Belkaoui (1980) directly assess the behavioural impact of social responsibility information on investment decision-making. Both studies, however, were limited to using financially quantified experimental social information (human resource accounting, and pollution cost information) disclosed within the financial statements or footnotes thereto. Consequently, little is known about the decision impact of the qualitative environmental information that firms more typically disclose outside of the financial statements in their annual reports. This study specifically investigates the magnitude of the decision impacts of positive and negative environmental information on investment decision-making.

2. Prior literature and hypotheses development

In contrast to the decision criteria of relevance and reliability (FASB, 1980:10), Dierkes and Antal (1985) present a different and comprehensive approach to decision usefulness. In terms of corporate social responsibility, they suggest investigating:

- How important is the concept of corporate social responsibility to users?
- How much corporate social disclosures satisfy users' information needs when making decisions?
- Is social disclosure considered usable; is the information perceived to be reliable and is it presented in such a way that it can be used?
- Does corporate social disclosure actually change decision-making behaviour?

Assessing the perceived usefulness of corporate social disclosures to users, then, is considered the beginning: the ultimate test is its impact on decision-making. Separating 'usefulness' into attitudinal (perceptions) and behavioural (impact on behaviour) measures is also important because as psychologists have long known, relations between attitude and behaviour are not certain to exist (Schuman and Johnson, 1976).

Early surveys report that only when making specific ethical investments is social information in annual reports perceived to be particularly useful (see, for example, Buzby and Falk, 1978; Rockness and Williams, 1988; Harte et al., 1991). For 'general' investment decision-making, social information is perceived to be of only moderate importance (Firth, 1978; Buzby and Falk, 1979; Benjamin and Stanga, 1977; Teoh and Shui, 1990). Recent evidence from Australia (Deegan and Rankin, 1997), New Zealand (Goodwin et al., 1996), and the US (Epstein, 1992), however, now reports strong shareholder demand for the disclosure of corporate environmental performance. Epstein (1992:83) suggests shareholders 'want their firms to put more funds into cleaning up their plants and stopping environmental pollution—even when that means receiving smaller dividends'.

Such strong positive attitudes to environmental reporting, however, are not universally held. Investment analysts, bankers and others from the financial advisory sector when asked consistently seem to down play the importance of such information (Deegan and Rankin, 1997; Teoh and Shui, 1990). Evidence from UK City analysts, for example, suggests analysts are driven by the requirements of their clients, which they interpret to be primarily a positive financial outcome on the clients' investments. Issues considered moral or emotional are not seen as part of the analysts' remit, unless such issues have identifiable financial consequences (BIE, 1994:13, quoted in Deegan and Rankin, 1997:566). Analysts, then, claim their assessments are made on rational, financial criteria.

In contrast, experimental evidence suggests bankers, accountants and others with a financial training do take note of corporate social information when making investment decisions. Belkaoui (1980), for example, reports additional pollution abatement cost information produces positive effects on the investment decisions of bank loan officers and accountants. While loan officers preferred the company that was making greater investments in pollution abatement equipment regardless of their investment strategy, accountants preferred the company making pollution abatement investments only under a capital gains investment strategy. Under a short-term investment strategy, they switched funds away from the heavy investor in pollution abatement equipment.

---

[1] See, for example, Bruns (1965), Dyckman (1965), Dopuch & Ronen (1973), Ortman (1975), Livingstone (1972), and Duncan and Moores (1988).

While the differences in the survey and experimental results could reflect real inconsistencies in the attitudes and behaviours of financially trained investors to corporate environmental information, they may also reflect differences in the research signals. Survey respondents may be unwilling to openly admit to the influence of 'soft' environmental information when asked, yet when observed more covertly, such an influence becomes apparent. Alternatively, though, the experiments focus on financially quantified social information disclosed within the (audited) financial statements or footnotes thereto, while the surveys rarely specify the kind of social and environmental information to which they seek responses. Such experimental information is consistent with permitting an assessment of the 'financial consequences' of a firm's social and environmental actions, but what of the more typical narrative environmental disclosures outside of the financial statements? Can we expect this narrative information to elicit similar investment reactions? And can we expect equal (but opposite) reactions to narrative information that is disclosed by 'good' and 'bad' environmental performing firms?

The classic argument from some economists is that beyond what is legally required, corporations should not waste shareholders' resources on matters of social responsibility (Friedman, 1962, 1970; Hayek, 1969). Investors are likely to react negatively to such firms if they anticipate reduced profitability with no corresponding reduction in risk (Holman et al., 1985). The counter argument, however, is that social responsibility does reduce the risk of future costs and liabilities that may result from tougher rules and regulations brought against anti-social behaviour (Holman et al., 1985; Epstein, 1992). Investors, therefore, might reward socially responsible firms in terms of higher investments for their ability to anticipate and and avoid future costs and liabilities.

Taking a rational and cost/benefit approach to voluntary disclosures, Verrecchia (1983), Lewis et al., (1992), and Craswell and Taylor (1992) argue that firms voluntarily disclose only that information they perceive will increase the value of the firm. Where the perceived harm of information outweighs the benefits, the information is unlikely to be provided. The corollary is that a firm that incorrectly provides negative information reduces its value. To the extent that firms are capable of correctly judging the reactions of their investors, then, we should expect to see positive investor reactions to the extent that environmental disclosures convey competitive advantage, industry leadership, future cost savings as well as the likelihood of avoiding future penalties. Disclosing 'excessive costs' in achieving such outcomes, however, could result in negative investor reactions.

In many ways, then, the literature seems to have a bet each way on how investors might react to positive environmental disclosures. While Belkaoui (1980) perhaps provides the strongest evidence in favour of a positive reaction, his results are inconsistent, and doubts must remain about the extent to which his experimental results hold for a decision experiment involving narrative environmental disclosures.[2] Over the long run, the reduced risks and potential benefits from an exemplary environmental management programme should be more readily perceived. The likelihood of investors reacting negatively in the manner that Friedman and others suggest seems more likely, if it is to occur at all, under a short run strategy.

Despite no published survey or experimental evidence on investors' reactions to negative environmental disclosures, we expect a negative reaction. The voluntary disclosure literature suggests firms will avoid disclosing negative news for fear of devaluing the firm, and to date the environmental disclosures literature strongly supports this view (see, for example, Deegan and Rankin, 1996). Consequently, strong negative investor reactions to environmental disclosures that admit breaches of environmental regulations and incur penalties for doing so are expected.

From an experimental design of one control and two independent treatment (labelled 'saint' and 'sinner') groups each making a two company (A and B) portfolio investment decision, the following four (null) hypotheses are suggested:

$H1_0$: under a long-term investment strategy, in which the treatment (saint) group is provided with positive environmental disclosures, there is a non-positive difference in the mean amount invested by the control group in company A (or B) and the mean amount invested by the saint group in company A (or B).

$H2_0$: under a short-term investment strategy, in which the treatment (saint) group is provided with positive environmental disclosures, there is no difference in the mean amount invested by the control group in company A (or B) and the mean amount invested by the saint group in company A (or B).[3]

---

[2] While several stock market reactions' studies have found positive reactions to (positive) social disclosures (see, for example, Anderson & Frankle 1980; Belkaoui 1976; Shane & Spicer 1983), the ability of such studies to provide predictions for financially trained investors making single decisions must also be doubtful. Several other stock market studies also have found negative or no reactions (see, for example, Ingram 1978; Mahapatra 1984; Freedman and Jaggi 1986).

$H3_0$: under a long-term investment strategy, in which the treatment (sinner) group is provided with negative environmental disclosures, there is a non-negative difference in the mean amount invested by the control group in company A (or B) and the mean amount invested by the sinner group in A (or B).

$H4_0$: under a short-term investment decision horizon, in which the treatment (sinner) group is provided with negative environmental disclosures, there is a non-negative difference in the mean amount invested by the control group in A (or B) and the mean amount invested by the sinner group in company A (or B).

3. Method

The literature presents two main approaches to assessing the decision impact of environmental information for investment decision-making, namely capital market research and survey-based decision experiments. Capital market studies posit that if social and environmental disclosures have informational value, then they would be reflected in share price changes. Survey-based experiments, on the other hand, assess decision impact more directly. While both approaches have limitations,[4] the choice to adopt an experimental survey for this study was primarily due to the interest of investigating the usefulness of environmental information for investment decisions at the disaggregated micro level. As opposed to capital market research, surveys enable particular user groups or segments of the population to be investigated. Likewise, surveys offer considerable control over the information signals being investigated. Market reaction studies, for example, cannot investigate the impact of voluntary negative environmental information, since it rarely gets disclosed. Surveys also permit an examination of individuals' perceptions of the environmental information used in their decision-making and the relative impact it may have. Nonetheless, it needs to be remembered that investment decision experiments are just that: experiments. As such, experiments rarely involve the investment of real funds and often over-simplify the real decision-making process by, for example, providing the information rather than letting the decision-makers gather their own.

3.1. Sample selection

Investment analysts and accountants were selected as subjects for this study. The subjects were randomly selected from the membership list provided by the local Institute of Chartered Accountants and directly accessed through the local Society of Investment Analysts.[5] By way of the research design, three independent random samples of 60 accountants and three independent random samples of 60 investment analysts were drawn. This study acknowledges that accountants and investment analysts may not be strictly investors *per se*. However, for the purposes of this study, the definition of an 'investor' is not so much a current shareholder but an individual who possesses the necessary skills to evaluate investments.

The choice of participants for the study obviously involves some trade-offs. Studies by Lee and Tweedie (1975, 1976), for example, show that 'sophisticated' investors (individuals who possess a significant degree of experience in accounting and financial matters) are more likely to understand financial reporting practices and the accounting information contained in the annual report than 'unsophisticated' investors. Although not a prerequisite for this study, such professionals are likely to be investors on behalf of themselves, their companies or their clients anyway. Financially trained 'investors', then, are more likely to increase the internal validity of the experiment. Nonetheless, such participants also limit the extent to which the experimental findings can be generalised to other investor groups.

3.2. Experimental design

Modelled after the instruments used by Hendricks (1976) and Belkaoui (1980), participants from each professional group were asked to compare two firms, Company A and Company B, and then allocate $50,000 as equity investment between the two firms under two investment strategies. The two investment strategies (i.e., invest for speculative profit and invest for long term share ownership) were explained to the participants to ensure uniformity of interpretation. The design of the experiment resulted in three information packets as follows:[6]

---

[3] Note, given the previous mixed results, a two-tailed test is proposed to reflect the possibility of a difference in either direction. Although it is far from standard practice, to reflect the possibility that there really is no difference between the two groups, and the survey evidence is in fact correct, when interpreting the test results an $\alpha = 0.10$ or higher value might be in order. While a higher α value increases the probability of rejecting a null hypothesis of no difference when in fact it is true, it also lowers the value of β: the probability of failing to reject a null of no difference when in fact it is false.

[4] For several critiques of capital market research, see, for example, Chambers (1974), Hines (1982), Black (1973), and Ullmann (1985). For a discussion of the limitations of surveys, see, for example, Oppenheim (1992).

[5] Due to the Privacy Act, the Society of Investment Analysts insisted on performing their own selection procedure, which we were assured would be random. Nevertheless, as researchers, we could not attest that this was in fact properly carried out.

Control

The first packet includes the financial statements of both companies A and B (labelled Alpha Inc. and Sigma Inc. respectively in the questionnaires) prepared according to conventional accounting procedures, (i.e., ignoring any environmental information). This first packet was mailed to one random sample of 60 accountants and one random sample of 60 investment analysts.

Saint

The second packet includes the same financial statements as the control packet, but, in addition, for Company A (labelled Lambda Inc. in the questionnaire) the financial statements were preceded by a page of neutral (i.e., non-environmental) narrative statements. For Company B (labelled Gamma Inc. in the questionnaire) a page of environmental statements was added. The environmental statements were contrived to indicate a strong and positive commitment to environmental issues. This second packet was mailed to another random sample of 60 accountants and to another random sample of 60 investment analysts.

Sinner

The third packet includes the same financial statements as the other two packets, and the same page of neutral, narrative statements for Company A (labelled Kappa Inc. in the questionnaire). For Company B (labelled Beta Inc. in the questionnaire), however, the environmental statements were contrived to indicate a weak and somewhat negative commitment to environmental issues. This third packet was mailed to the other random samples of 60 accountants and 60 investment analysts.[7]

Following analysis of the information provided, and their allocation decisions, participants were also asked to briefly explain their decisions with specific reference to the information provided and their analyses. Background information on the respondents' professional affiliations, age, education and experience was also requested. This background information provided a check that the respondents qualified as sufficiently skilled to evaluate the investment opportunities.

The financial statements of companies A and B[8] were excerpts taken from the annual reports of two real companies from the same industry. Every care was taken to conceal the identity of the two companies and the industry to which they belonged. The financial statements comprised the balance sheet, profit and loss statement and the cash flow statement, each providing a three-year history of the firm's financial results. In order to reduce the effort needed to analyse the financial statements, the balance sheet and the cash flow statement were aggregated and simplified. Additional information such as key financial ratios[9] and actual share prices for two years were also provided to aid the analysis.

For the saints and sinners packets, a page of neutral statements for Company A was included to ensure that the subjects were not just responding to *more* information being disclosed for Company B. The neutral statements were excerpts from actual annual reports that were later modified to conceal any description of names or places, and also for sentence structure and flow. To indicate to the respondents that the page of narrative statements preceding the financial statements were to be viewed as part of the annual report, they were told specifically in the cover letter. Further, the heading on each page of statements was appropriately titled, for example, 'Chairman's Review of Gamma Inc.'

For the environmental statements, the task involved selecting statements to indicate a strong and positive commitment to environmental issues on the part of the *saint* company, and a weak and negative commitment on the part of the *sinner* company. Few real statements existed that suited our purposes, so the statements were largely contrived. As a focus for the statements, the issue of cleaning up environmental pollution was chosen. Epstein (1992), for example, had found that investors were willing to forego higher dividends in favour of companies' spending money to 'clean up their plants and stop pollution'. Consequently, as an environmental issue to elicit a reaction on the part of investors, a focus on pollution control seemed appropriate.

---

[6] Full copies of the information packets are available from the authors upon request.
Please e-mail: mmilne@commerce.otago.ac.nz

[7] The experimental design in this study employs an independent samples design (the treatment groups and the control groups are compared using measures (e.g., mean) of the groups' responses). The disadvantage with this design is that because it provides for no control (other than randomisation) on individual responses across control and treatment groups, a large variance of responses in each group will make it more difficult to obtain significant differences. The alternative—a repeated measures or related samples design—however, could contaminate the experiment by sensitising the respondents when asking them to complete essentially the same task twice. Respondents may 'spot' the obvious difference between the information packets, and one never knows, then, whether the results are socially conditioned or genuine. A repeated measures design would also have had a large detrimental impact on the response rate. Consequently, the independent samples design was used.

[8] The financial statements and other financial information are identical for the three pairs of companies. Sigma, Gamma and Beta are identical, as are Alpha, Lambda and Kappa.

[9] The choice of key financial ratios was based on Gibson's (1987) study that ranked 60 ratios in terms of their relative importance to chartered financial analysts. Each of the eight ratios selected was among the top four in their classification (i.e., measuring profitability, liquidity or debt) ranked in terms of relative importance.

The basis for contriving the positive statements for Gamma Inc. included drawing on the exemplars and recommendations made in the literature (for example, Gray et al., 1993; IISD/Deloitte and Touche/BCSD, 1992; Owen, 1992; ICEAW, 1992; UNCTC, 1991; KPMG, 1997a). Disclosures of environmental policies, and commitments to sustainable development, for example, are seen as signalling that a company is taking the environmental agenda seriously (Gray et al., 1993). Likewise, disclosures of environmental expenditures, especially when coupled with an environmental policy, are seen as positive evidence that the environmental policy is being implemented. Other recommendations include developing a specific group at the highest levels of management to oversee the environmental policy and its implementation. Similarly, companies are encouraged to disclose activities and performance levels towards set environmental targets self-imposed by the company. It will be seen from the Appendix that the two paragraphs of statements derived for Gamma Inc.'s environmental performance include many of these recommendations.

For the *sinner* company (Beta Inc.) the environmental statements were contrived to indicate a negative image. This was achieved by admitting breaches of emissions standards resulting in court action and substantial fines being imposed. Likewise, the statements were also intended to convey the message that economic concerns override environmental ones, and that the replacement of older, dirtier technology was not likely in the near future. Continuing future breaches of emission standards were implied. The commentary also indicated a strong dissatisfaction with the emission levels that had been set. Given that annual reports rarely promote negative images of companies on any matter, some care was taken not to go overboard and become unrealistic. The commentary tended to be deliberately couched in terms of excuses and 'we'll try to do better'. The environmental statements used for Beta Inc. are included in the Appendix.

While decision experiments such as this do capture behavioural changes rather than attitudes, they do so under controlled and hypothetical conditions. The extent to which such behaviour would be repeated in real decision situations is always open for debate, but the contrived nature of the experiment will limit how far the findings can be generalised. The concentration of the environmental statements in just one page, for example, is recognised as non-representative of the average annual report, and different results may arise if the statements had been dispersed across a few pages resulting in a less intense dosage of the treatment. Similarly, the environmental disclosures may say as much about management's honesty as about the companies' environmental performance. Disclosures of fines and clean-up expenditure sums are so atypical that we need to be wary that any observed reactions to the information are also not atypical. In addition, the relative magnitude of the sums involved (less than 1% of sales for the fines, and 7% of sales for the clean-up expenditure) also need to be considered in judging the extent to which any observed behaviours would occur in reality.

4. Data analysis and results

4.1. Response rate and background information on respondents

The usable responses from each of the samples are shown in Table 1. The usable response rate was approximately 24%, and Table 1 indicates that the response rates for each of the control and treatment groups were largely the same.[10] More than two thirds of the respondents have undertaken at least five to six accounting and finance related tertiary level courses, and possess six or more years of experience in evaluating financial statements. The great majority of respondents indicate that they possess the relevant expertise and experience to participate in this study. No significant differences using Mann-Whitney U tests could be detected in the age, education or experience levels on the basis of the treatment groups and by professional group.

4.2. Responses to the investment decision

The descriptive statistics for the responses to the investment decision task under each of the three treatments are shown in Tables 2 and 3. Table 2 indicates the mean percentages of the $50,000 invested in each pair of companies under the different investment strategies depending upon which professional group the respondent belonged to and depending upon which treatment group they were assigned to. From Table 2, it is clear that company A (Alpha/Lambda/Kappa) attracts almost twice the average amount of investment funds as company B (Sigma/Gamma/Beta). However, this result by itself is not particularly important. What is more important is if the average amount invested in Company A or Company B significantly

---

[10] Personally addressing potential respondents from the Society of Investment Analysts was not possible, and this may explain the lower response rates for the investment analysts. Relatively low response rates are not unexpected for the investment decision task questionnaires, given their extra length and time-consuming nature—although weak, early/late non-response bias tests revealed no significant differences at the 5% level. Given the relative response rates, any non-response bias also seems likely to apply equally to the control and treatment groups.

Table 1: Investment decision task responses

	Accountants	Investment Analysts	Total
Control Group			
Sent & Received	53	59	112
Usable	15	14	29
Rate	28%	24%	26%
Treatment (Saint) Group			
Sent & Received	59	56	115
Usable	16	11	27
Rate	27%	20%	23%
Treatment (Sinner) Group			
Sent & Received	60	57	117
Usable	15	12	27
Rate	25%	21%	23%

Table 2: Mean percentages (of $50,000) invested in each company

Group	Additional Information	Company	Profession	N	Investment Strategy	
					Long Term	Short Term
Control	None	Sigma	Acc'tant	15	31%	48%
			Inv A'lst	14	33%	30%
		Alpha	Acc'tant	15	69%	52%
			Inv A'lst	14	67%	70%
Saint	Environmental (positive)	Gamma	Acc'tant	16	35%	33%
			Inv A'lst	11	21%	21%
	Neutral	Lambda	Acc'tant	16	65%	67%
			Inv A'lst	11	79%	79%
Sinner	Environmental (negative)	Beta	Acc'tant	15	14%	35%
			Inv A'lst	12	11%	18%
	Neutral	Kappa	Acc'tant	15	86%	65%
			Inv A'lst	12	89%	82%

changes as a result of the 'investors' receiving different information sets.

Before proceeding to examine the differences between the control and treatment groups, it is worth briefly reporting that statistical tests for differences in response due to 'professional group' were not significant at the 5% level or less.[11] From Table 2 it is clear the accountants are willing to put 17% more of their funds into Beta (the sinner) in the short term than were the investment analysts, but the differences are not significant. For differences in investors' responses due to the different investment strategies, the only significant result to arise was for the accountants group under the sinner treatment.[12] As shown in Table 2, the accountants on average switched 21% of their funds into Beta Inc. under a short-term strategy compared to their long-term strategy decision. This switch was significant at $p<5\%$ under both the paired-t and Wilcoxon tests. Nine of 15 accountants switched more money into Beta under the short-term strategy than under the long-term. In contrast, three of 11 investment analysts did so. In all other cases, though, significant professional group and investment strategy differences are not observed.

---

[11] To test professional group differences, parametric independent samples t and non-parametric Mann-Whitney U tests were performed. None of the twelve tests (results not reported) were significant at the 5% level, and the non-parametric tests

Given few significant differences between the professional groups, Tables 3, 4 and 5 report the results of the experiment with the two professional groups combined. As shown in Table 3, the average amount invested in company B (Sigma/Gamma) actually *decreases* ($15,948 → $14,629) under the long-term investment strategy as a result of the positive environmental information. Similarly, under the short-term investment strategy, the average amount invested in company B (Sigma/Gamma) also *decreases* ($19,741 → $14,047) as a result of the positive environmental information. While neither of these differences are statistically significant (see Table 4) the direction of the differences are somewhat surprising, perhaps mostly so for the long-term strategy. The 'somewhat' reflects the possibility, as discussed in the literature review, that some investors may actually penalise companies for spending funds on what they see as non-essential and non-core activities.

Table 3 indicates no surprises for the investor reactions to the negative environmental information. As expected, the average amount invested in company B under both investment strategies decreases: $15,948 → $6,389 under the long-term, and $19,741 → $13,800 under the short-term. The main effects (Hypotheses 1–4) were tested with independent t statistics for the equality of the mean amount invested and Mann-Whitney U statistics. The results are shown in Table 4. Based on the evidence, the allocation of investment funds be-

Table 3: Descriptive statistics for decision responses with professions combined

Investment strategy	Group	Company	Mean (in $)	Std Dev (in $)	K-S Stats (Z values)
Long term	*Control*	Sigma	15948.28	14117.08	1.157
	N=29	Alpha	34051.72	14117.08	1.157
	Saint	Gamma	14629.63	13722.94	1.167
	N=27	Lambda	35370.37	13722.94	1.167
	Sinner	Beta	6388.89	9515.51	1.775**
	N=27	Kappa	43611.11	9515.51	1.775**
Short term	*Control*	Sigma	19741.38	16068.28	0.895
	N=29	Alpha	30258.62	16068.28	0.895
	Saint	Gamma	14074.04	13939.23	1.219
	N=27	Lambda	35925.96	13939.23	1.219
	Sinner	Beta	13800.00	12932.52	0.885
	N=25	Kappa	36200.00	12932.52	0.885

** Significant @ the 1% level

---

confirm the t-test results. Kolmogorov-Smirnov goodness-of-fit tests (results are not reported by professions separately) for normality indicate that the distributions of all the response categories are approximately normal, expecting the responses from both the accountants and the investment analysts to the companies in the sinner group. However, on the basis of the benchmarks provided by Foster (1986), the skewness and kurtosis scores indicate non-normality for these other distributions. Parametric and non-parametric tests, therefore, are used to analyse the data and to confirm the results.

[12] To test differences relating to different investment strategies, parametric paired-t and non-parametric Wilcoxon matched-pairs signed-ranks tests were performed. Results from five of six tests are not significant.

Table 4: Decision impact of environmental information (tests for equality of mean amounts)

Investment strategy	Group	N	Company	Mean (in $)	*t*-test (sig level)	Mann-Whitney (sig level)
Long term	*Control*	29	Sigma	15948.28		
	Saint	27	Gamma	14629.62	0.724	0.707
	Sinner	27	Beta	6388.88	0.004	0.004
Short term	*Control*	29	Sigma	19741.37		
	Saint	27	Gamma	14074.04	0.164	0.172
	Sinner	25	Beta	13800.00	0.139	0.177

tween both companies in the control and the treatment groups under each investment strategy were only statistically significantly different for the impact of negative environmental information under the long-term investment strategy, and only Hypothesis 3 can be rejected.

To gain further insights into the reactions to the positive and negative environmental information, Table 5 presents a breakdown of the mean amounts invested in company B (Gamma/Beta) for each treatment group by each investment strategy. The breakdown is by the stated reactions of investors to the environmental information. Responses to the request to 'briefly explain your investment decision' with 'specific reference to the information provided and your analysis' were classified into three groups: those making positive statements about the firm's environmental performance, those making negative statements, and those not referring to the firm's environmental performance.[13] The small group size, however, rules out statistical tests, and caution is required in interpreting the results.

4.3. Long term behaviour

About 50% (13) of the respondents in the sinner group admitted to being influenced by the negative environmental information, and, on average, invested $3,653.00 in Beta. Typical comments made by this sub group were: '*Long term problems seen with effluent discharges. Tightening of discharge obligations and the need to invest in plant along with*

---

[13] All of the 54 respondents made written responses to the request to explain their allocation decisions.

Table 5: Breakdown of mean amounts invested by reported reactions to environmental information

Investment strategy	Group	N	Company	Mean (in $)	Reported reactions to environmental news
Long term	*Saint*	27	Gamma	14629.62	
		5		30000.00	Positive
		4		2500.00	Negative
		18		13055.00	None (only Financial)
	Sinner	27	Beta	6388.88	
		13		3653.00	Negative
		1		35000.00	Positive
		13		6923.00	None (only Financial)
Short term	*Saint*	27	Gamma	14074.04	
		1		15000.00	Positive
		3		00.00	Negative
		23		15869.40	None (only Financial)
	Sinner	25	Beta	13800.00	
		4		3750.00	Negative
		2		35000.00	Positive
		19		13684.00	None (only Financial)

manufacturing process problems with effluent cause me concern with Beta.' The other 13 respondents in the sinner group also clearly seemed to have been influenced by the negative environmental information. Despite not mentioning the firm's environmental performance, on average they invested half as much in Beta ($6,923) as a control group ($15,948).

In contrast, the reactions of the saint group under a long-term strategy are more mixed. First, only nine (33%) respondents admitted to being influenced by the positive environmental information, with almost as many respondents having negative reactions (15%) as having positive reactions (18%). Second, 18 (66%) respondents do not report a reaction to the positive environmental information, and the average sum they invest ($13,055 compared to a control group of $15,948) indicates by and large a non-reaction. Those reacting positively referred to long-run benefits of clean production. As one typical respondent suggested, '*Pressure groups will force manufacturers to be "clean". Gamma has already achieved this and whilst the culture is inhibiting growth now, it will pay dividends later.*' Those reacting negatively, however, either seemed to confuse and read the statements as negative, or were reacting against the costs involved in providing clean production. One respondent suggested '*massive unnecessary expenditure by Gamma*', while another, despite Gamma's extensive commitment to clean-up, suggested they had '*concerns over future environmental claims against Gamma*'.

4.4. Short term behaviour

Under the short-term strategy, judging by the mean amounts invested ($15,869 and $13,684 compared to a control group of $19,741), most respondents seem unaffected by either the positive or the negative environmental information. The few negative reactors continued to emphasise the '*possible negative publicity and expenditures required*' and that '*Beta's share price seems to have more downside than upside.*'

Table 5 also reveals quite a switch in funds invested by the sinner group under a short-term strategy compared to its investments in the long-term. The group overall, and on average, puts twice as much into Beta in the short term ($13,800) as it does in the long run ($6,388). Seven (25%) individuals mentioned the poor environmental performance of Beta as reasons for not investing in Beta in the long run, but do not do so under the short run. On average, these seven put three times as much into Beta under the short run ($13,684) as they do under the long run ($3,653). Even those who consistently do not mention the firms' poor environmental record under either strategy have on average nearly doubled the amount in Beta under the short term.

A close inspection of the response sheets reveals that the respondents making the biggest switches of funds to Beta in the short run were accountants. Why accountants should be willing to turn a blind eye to Beta's environmental performance in the short term, but not in the long term, is partly revealed through their comments. Many of these respondents seemed to be willing to discount the risks of Beta's environmental record in favour of its potential for returns. As one respondent put it: '*Beta maybe a reasonable investment in the short term with their desire to increase payments to shareholders. The longer solution required for environmental reasons could eventually ruin the company.*'

5. Discussion and conclusions

The predominant avoidance behaviour to the poor environmental performer observed under both strategies for the investment analysts, and under the long-term strategy for the accountants was as expected. Such results are entirely consistent with the prior literature on the absence of negative voluntary disclosures (Verrecchia, 1983; Lewis et al., 1992; Craswell and Taylor, 1992). Clearly, the investment impacts observed are likely to reduce firm value in the long run at least. The lack of negative environmental disclosure is well documented (see, for example, Guthrie and Parker, 1990; Hackston and Milne, 1996; Deegan and Gordon, 1996; Deegan and Rankin, 1996) and the results from this study offer support for *one* possible reason why: they are likely to turn investors off.

Consistent with the BIE (1994) report, most investors evaluated the negative environmental information in terms of its risk and financial consequences rather than its moral or ethical consequences. Moreover, the accountants group made it quite clear through their short term behaviour that where ethical reasoning might conflict with financial reasoning, there was little contest: earning a dollar was more important than the prospect of future breaches in emission standards and water borne pollution from chlorine. Consistent with Friedman's (1962, 1970) argument, Belkaoui (1980) observed that accountants under a short-term strategy tended to avoid the firm making expenditures on pollution abatement. Actively seeking to invest in a firm that is avoiding its social responsibilities, however, seems to stretch even Friedman's argument, but presumably breaching emission limits and paying the fines for doing so could be considered to be operating within the 'rules of the game'.

A further point to note is that analysts and accountants *do* significantly react to narrative environmental information. Of course some may be genuinely unaware of the decision impact. A substantial proportion in this study, for example, while clearly reacting to the information, failed to mention it explicitly. The reactions may be limited to negative disclosures, but at the very least those undertaking future surveys need to be clear and specific about the information they have in mind when seeking responses.

The reactions to the positive environmental information were much weaker, more mixed, and neither of the hypotheses of no effect could be rejected. While several investors reacted as expected, and sought to reward the company for its actions, several, consistent with Friedman (1962, 1970), reacted negatively either because of the cost outlays involved or because of concerns about the firm's environmental impacts. Consistent with much of the survey evidence (e.g., Deegan and Rankin, 1997; BIE, 1994: Teoh and Shui, 1990), most respondents to the positive information seemed not to be, and made no claims to be affected by the environmental information. From this study, then, at least some investors could always be found to behave in each of the ways suggested in the literature review, and, consequently, the issue is which investor behaviour dominates, and why.

In the case of the negative environmental information, as expected, and as revealed in the comments, the dominant behaviour was one of avoidance on the grounds of increased exposure to environmental liabilities and future expenditures. In the case of the positive environmental disclosures, however, the dominant behaviour is not to react to the disclosures of leading environmental management initiatives. Two main explanations seem possible for the absence of a positive reaction: either most of the respondents simply didn't read the narrative disclosures, or they did and discounted the information as unimportant.[14]

While financially trained investors could be so fixated on numerical analysis that they only focus on information contained in the financial statements, we doubt this occurred in the experiment. The instructions clearly drew attention to both the financial and the narrative information, and more importantly, the negative narrative information was far from ignored. Speculating a little, several reasons could account for why the information and the initiatives may have been discounted. For example, the signalled environmental commitment could be seen as insufficient and 'immaterial'. We doubt this, however, since the clean-up expenditure referred to in the environmental statements amounted to 7% of sales over two years, and was double the sum paid in dividends over the same two years. Interestingly, Epstein's (1992) findings that shareholders want more funds put into stopping environmental pollution even when that means receiving smaller dividends were neither supported nor discounted by the results from this experiment. Most of the 'investors' seemed unaffected by the expenditure.

Alternatively, the competitive advantages and future cost savings that might be gained from the initiative were perhaps seen as insufficient or that any benefits to be gained from cleaning up now and avoiding future liabilities were perceived insufficient. With some reflection on the New Zealand context within which the investors in this study operate, both explanations seem plausible.

New Zealand, unlike the US, the UK and much of Northern Europe, has little history of mass industrialisation in which factories have laid waste the environment through air and water pollution. Its late settlement by Europeans, its geographic isolation, and its relatively sparse population probably explain more than the attitudes of its people, but the point remains that it may be difficult for any organisation to stand out as clean when the scale and concentration of industrial pollution has been minimal. Developing a competitive advantage on the basis of cleaner production may be difficult when the public (mis)perception and cliché image of the entire country is one of 'clean and green' (Yarwood, 1996).

New Zealand also has yet to develop any kind of social or ethical investment industry. Without a mechanism to promote and encourage the development and positive impact of socially responsible investment (Owen, 1992), it might be difficult for organisations to find investor appeal on the basis of their social and environmental performance.

The risk of future much tougher legislation imposing significant costs on businesses in New Zealand for unclean behaviour also seems quite remote. In comparison to US legislation, New Zealand's recent (1991) Resource Management Act (RMA), for example, imposes relatively trivial fines for breaching discharge permits (Milne, 1992; Greenpeace, 1996a; Miller, 1997). Moreover, unlike the US, Australia and other countries, New Zealand has no dedicated national agency (e.g., Environmental Protection Agency) responsible for enforcing its environmental legislation. Enforcing the provisions of the RMA, for example, is left to local and regional authorities (councils), and some doubts remain about their ability to do so effectively (Greenpeace, 1996a).

---

[14] To uncover the reasons for this non-reaction, raising the issue directly with the respondents, unfortunately, was ruled out. To do so during the experiment in anticipation that they might ignore the information would have contaminated their responses. To do so after would have meant sacrificing their anonymity and possibly response rates. Raising the issue directly may not have elicited honest responses anyway, since part of the question clearly raises the ethical matter of why have they not rewarded a leading environmental management initiative.

In our experiment Gamma spent $10m cleaning up, yet over a two-year period Miller (1997) finds only three successful corporate prosecutions under the RMA with maximum fines of $60,000. If investors are aware that fines rarely occur, and that when they do they are relatively trivial, the prospect of having a company spend 20–30 times those amounts to avoid them and clean-up may not be perceived as beneficial. Greenpeace NZ's (1996b, 1996c) attempt to persuade investors to avoid Fletcher Challenge due to its polluting pulp and paper plant technology, interestingly, was argued long in terms of the competitive and strategic disadvantages of not upgrading to cleaner technology, rather than the prospect of tougher legislation imposing further costs.

A lack of investor concern with the environment is also consistent with New Zealand's rather poor showing in international comparisons of corporate external environmental reporting. KPMG ranked New Zealand companies the lowest for both their annual report and their environmental report disclosures (KPMG, 1997a). Despite the absence of any legal requirement in New Zealand to make environmental disclosures, KPMG (NZ) has run a 'Best Annual Environmental Report Award' since 1993 to encourage the development of voluntary external environmental reporting by New Zealand companies. The relative lack of success of this initiative, however, also seems to point to a lack of investor pressure for change. Summing up the third annual awards, the judging panel concluded:

> 'In the previous two years of this Award the judging panel had expressed its disappointment at the inadequacy of environmental reporting by companies here [in New Zealand], particularly when contrasted with the rapid rate of improvement in many other countries. This sentiment is echoed again this year, but with some grounds for optimism. The best [4 companies in total], at least, are getting better. The rest, however,...are still failing to acknowledge their impacts and report on how they are being addressed' (KPMG, 1997b).'

New Zealand's relatively clean environment, its lack of a social and ethical investment industry, its relative light-handed approach to pollution penalties, and its lack of environmental reporting practices, then, could all explain at least in part the lack of investor interest with disclosures of leading environmental management. Conversely, in the US, the UK and other European countries we might expect more dominant and stronger positive reactions from investors to disclosures of leading environmental management. The extent to which any such behaviour might dominate in these other countries, however, would be a matter for future research studies. Similarly, extending the results beyond our sample of investors to other New Zealand investor groups (e.g. non-institutional shareholders) will also require further research.

Verricchia (1983), Lewis et al., (1992) and Craswell and Taylor (1992) all argue that firms tend only to make voluntary disclosures when they perceive it will benefit the value of the firm by doing so. The current lack of reporting by New Zealand companies, and anecdotal evidence from KPMG's environmental unit, suggest that many New Zealand firms doubt the existence of these benefits or fear the risks are too great.[15] The experimental results found in this study seem consistent with these interpretations. Based on the results from this study, Bowman and Haire's (1975) observation that 'it pays to be good, but not too good', and Mintzberg's (1983:7) advice 'Don't stand out from the crowd, do no more than expected' appear particularly apposite.

Of course, one must not lose sight of the fact that the results from this experimental study are indicative at best. Whether accountants and investment analysts would react in the same way if firms were really making these disclosures, and they were making real investments remains unknown. Similarly, as we noted earlier, we do not fully understand precisely what in the information stimulated the observed reactions. Is it, for example, mention of the fines, the likely continuing court action, the stated attitude of management to pollution, or some combination of these? While future experiments might try to debrief decision-makers more fully in an attempt to address these questions, experimenters will always be left guessing to what extent their observed results will be repeated in real settings.

For those seeking to improve the rather impoverished state of New Zealand's corporate environmental reporting, the results from this study suggest that relying on the voluntary initiatives of corporate responses to investor pressures may be a long run strategy at best. As many other countries have found, corporate environmental reporting may require some kind of legislative basis to kick start it (see, for example, KPMG, 1997a). Not only would mandatory reporting ensure that companies disclose their negative environmental impacts, but it may also create, by placing all firms on an equal footing, positive incentives for firms to distinguish themselves by their superior environmental performance. This may then stimulate investor interest in such activities, and perhaps create the basis for developing a social and ethical investment industry.

---

[15] In a personal communication with a senior consultant at KPMG's environmental unit, for example, it was suggested that 'Many of our clients who are engaged in sectors with significant environmental impacts are interested in environmental reporting, but lack the confidence to do so. Either they are unsure of the benefits, or they fear their environmental management systems are not sufficiently developed to provide complete and accurate information on the company's effects and performance. They consider it risky to publish a report and then have it exposed as being incomplete.' Greenpeace NZ's (1996a) scathing attack on the validity of Tasman Pulp and Paper's 1996 environmental report certainly provides evidence of the level of public scrutiny to which such reports can be subjected.

Appendix

The following extracts illustrate the manipulated information to create the treatments of environmental saint and environmental sinner. In all other respects, the information provided to the two treatment groups was identical.

Extracts from Gamma Inc. (Environmental Saint)

Gamma is actively striving to meet its publicly stated environmental policy goals of: sustainable development through the responsible use of natural resources; operating within all of the environmental requirements applicable to its operations; monitoring environmental performance; and regularly reviewing and, when appropriate, applying successful new technology to improve performance where real environmental benefits will be achieved. During 19X1 and 19X2 close to nearly 10 million dollars has been spent on environmental improvement projects. During the past two years, for example, the Company has implemented 20 specific recommendations from its Environmental Advisory Board. In particular, we have given the problems of the smell and the discolouration of rivers associated with our major operations our fullest attention. Water discolouration resulting from chlorine-based chemicals removed during our operations has been reduced by 20% since 19X0. Since the completion of the company's effluent treatment systems in 19X1, the biochemical oxygen demand (BOD) levels of the company's effluent have consistently been less than half of the allowable limits. Such success is largely attributable to the Company's policy of setting emission targets that are much lower than the allowable licence limits.

Continuing refinements to operating procedures have also reduced odorous sulphur gas emissions from all operations. Since 19X0, odour emissions have been reduced by more than 90%, and following the installation of a new state-of-the-art vent scrubbing system at our Kakapo Plant, it is expected gas emissions will be virtually eliminated by the end of next year. We are already operating some of the cleanest plants in the world in relation to the production of these compounds, and soon will be within the tightest discharge limits being imposed anywhere overseas for our industry. Reducing its demand for fossil fuels is also an important objective for Gamma, and since 19X0 Gamma has cut its consumption of fossil fuels by 50%. The reorganisation of certain elements of the Company's transportation and distribution network and improvements in the production process at several plants will result in significant cost savings in the long run. The Environmental Advisory Board will continue to formulate plans and recommendations to identify procedures to be followed to prevent or minimise environmental problems at all our plants.

Extracts from Beta Inc. (Environmental Sinner)

In the case of the chairman's review of Beta Inc, the following paragraph was substituted in place of the two shown for Gamma Inc.

In respect of its environmental performance, during the past year the Company has paid some attention to the problems of the smell and discolouration of rivers associated with its major operations, and it will continue to seek affordable solutions to those problems. Water discolouration resulting from chlorine-based chemicals used during our operations, however, has been a particular problem to which there is no easy solution. With large and technically complex plants things do not always work out as intended, and during the past year, despite attempts to remedy the situation, the Company did breach its allowable discharge permits on several occasions. Unfortunately, such breaches resulted in the Company facing several prosecutions by the licensing authority in the Environment Court. One such court action has resulted in a $50,000 fine. However, for several others the Company intends to rigorously defend its actions. Of course it is unacceptable to ignore the fact that the Company's plants sometimes operate outside their emission limits, and so we are continuing to work on these problems. With older and less technologically-advanced plants, however, unless excessive costs are incurred, it is proving extremely difficult to find operating conditions which will minimise emissions much further. As the Company indicated at the time of their introduction, the new emission limits and their phasing-in arrangements for the older technology are simply too restrictive. While the Company fully supports the efforts to clean up the industry's environmental performance, the pace of such achievements also need to be carefully balanced against economic development.

References

Anderson, J. C. and Frankle, A. W. (1980). 'Voluntary social reporting: an Iso-Beta portfolio analysis'. *Accounting Review*, 55 (July): 467–479.

Belkaoui, A. (1976). 'The impact of the disclosure of the environmental effects of organizational behaviour on the market'. *Financial Management* (Winter): 26–31.

Belkaoui, A. (1980). 'The impact of socio-economic accounting statements on the investment decision: an empirical study'. *Accounting, Organisations and Society*, 5 (3): 263–283.

Benjamin, J. J. and Stanga, K. G. (1977). 'Differences in disclosure needs of major users of financial statements'. *Accounting and Business Research*, 7 (Summer): 187–192.

Black, F. (1973). 'Yes Virginia, there is hope: test of the Value Line Ranking System'. *Financial Analysts Journal* (Sept–Oct): 10–14.

Bowman, E. H. and Haire, M. (1975). 'A strategic posture toward corporate social responsibility'. *California Management Review*, 18 (Winter): 49–58.

Bruns, W. J. (1965). 'Inventory valuation and management decisions'. *Accounting Review*, 40 (April): 345–357.

Bruns, W. J. (1968). 'Accounting information and decision-making: some behavioural hypotheses'. *Accounting Review*, 43 (July): 469–480.

Business in the Environment (BIE), (1994). *City Analysts and the Environment*, Business in the Environment, London.

Buzby, S. L. and Falk, H. (1978). 'A survey of the interest in social responsibility information by Mutual Funds'. *Accounting, Organizations and Society*, 3 (3/4): 191-201.

Buzby, S. L. and Falk, H. (1979). 'Demand for social responsibility information by University investors'. *Accounting Review*, 54 (Jan): 23–37.

Chambers, R. J. (1974). 'Stock market prices and accounting research'. *Abacus*, 10 (1): 39–54.

Coopers & Lybrand (1993). *Business and the environment: an executive guide.* Sydney: Coopers & Lybrand.

Craswell, A. T. and Taylor, S. L. (1992). 'Discretionary disclosure of reserves by oil and gas companies: an economic analysis'. *Journal of Business Finance and Accounting*, 19 (1): 295–308.

Deegan, C. and Gordon, B. (1996). 'A study of the environmental disclosure policies of Australian corporations'. *Accounting and Business Research*, 26 (3): 187–199.

Deegan, C. and Rankin, M. (1996). 'Do Australian companies report environmental news objectively?' *Accounting, Auditing & Accountability Journal*, 9 (2): 50–67.

Deegan, C. and Rankin, M. (1997). 'The materiality of environmental information to users of annual reports'. *Accounting, Auditing & Accountability Journal*, 10 (4): 562–583.

Dierkes, M. (1979). 'Corporate social reporting in Germany: conceptual developments and practical experience'. *Accounting, Organisations and Society*, 4 (1): 87–107.

Dierkes, M. and Antal, A. B. (1985). 'The usefulness and use of social reporting information'. *Accounting, Organisations and Society*, 10 (1): 29–34.

Dierkes, M. and Antal, A. B. (1986). 'Whither corporate social reporting: is it time to legislate?' *California Management Review*, 28 (3): 106–121.

Dopuch, N. and Ronen, J. (1973). 'The effects of alternative inventory valuation methods—an experimental study'. *Journal of Accounting Research*, (Autumn): 191–211.

Duncan, K. and Moores, K. (1988). 'Usefulness of CCA information for investor decision-making: a laboratory experiment'. *Accounting and Business Research*, 18 (Spring): 121–132.

Dyckman, T. R. (1965). 'The effects of alternative accounting techniques on certain management decisions'. *Accounting Review*, 40 (April): 345–357.

Epstein, M. J. (1992). 'The annual report card'. *Business and Society Review*, (Spring): 81–83.

Epstein, M. J. and Freedman, M. (1994). 'Social disclosure and the individual investor'. *Accounting, Auditing & Accountability Journal*, 7 (4): 94-109.

Financial Accounting Standards Board, (1980). 'Qualitative characteristics of accounting information'. *Statement of Financial Accounting Concepts No. 2*, Stamford, Conn: FASB.

Firth, M. (1978). 'A study of the consensus of the perceived importance of disclosure of individual items in corporate annual reports'. *International Journal of Accounting*, 14 (1): 57–69.

Foster, G. (1986). *Financial Statement Analysis.* 2nd ed, NJ: Prentice Hall.

Freedman, M. and Jaggi, B. (1986). 'An analysis of the impact of corporate pollution disclosures included in annual financial statements on investment decisions'. *Advances in Public Interest Accounting*, 1: 193–212.

Friedman, M. (1962). *Capitalism and Freedom.* Chicago: Chicago University Press.

Freidman, M. (1970). 'The social responsibility of business is to increase profits'. *The New York Times Magazine*, Sept 13: 33.

Gibson, C. H. (1987). 'How chartered financial analysts view financial ratios'. *Financial Analysts Journal*, (May/June): 74–76.

Goodwin, D., Goodwin, J. and Konieczny, K. (1996). 'The voluntary disclosure of environmental information—a comparison of investor and company perceptions'. *Accounting Research Journal*, 9 (1): 29–39.

Gray, R., Bebbington, J. and Walters, D. (1993). *Accounting for the Environment.* London: Paul Chapman.

Gray, R., Kouhy, R. and Lavers, S. (1995). 'Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure'. *Accounting, Auditing & Accountability Journal*, 8 (2): 47–77.

Greenpeace, (1993). *The Greenpeace Book of Greenwash.* Washington DC: Greenpeace International.

Greenpeace NZ (1996a). *Pulp Fiction: The Environmental Impact of the Tasman Pulp and Paper Mill on the Tarawera River.* Auckland: Greenpeace NZ.

Greenpeace NZ (1996b). *Fletcher Challenge Paper: a report by Greenpeace on the environmental pressures and market trends constraining the prospects for Fletcher Challenge Paper.* March, Auckland: Greenpeace NZ.

Greenpeace UK (1996c). 'Greenpeace intervenes in Fletcher Challenge Share Offer'. *Greenpeace Business*, 31 (June/July): 5.

Guthrie, J. and Parker, L. D. (1990). 'Corporate social disclosure practice: a comparative international analysis'. *Advances in Public Interest Accounting*, 3: 343–352.

Hackston, D. and Milne, M. J. (1996). 'Some determinants of social and environmental disclosures in New Zealand companies'. *Accounting, Auditing & Accountability Journal*, 9 (1): 77–108.

Harte, G. and Owen, D. L. (1992). 'Current trends in the reporting of Green Issues in the Annual Report of United Kingdom companies' in Owen, D. L. (ed.), *Green Reporting—Accountancy and the Challenge of the Nineties*, pp. 166–200, London: Chapman and Hall.

Harte, G., Lewis, L. and Owen, D. (1991). 'Ethical investment and the corporate reporting function'. *Critical Perspectives on Accounting*, 2: 227–253.

Hayek, F. A. (1969). 'The corporation in a democratic society: in whose interest ought it and will it be run?' in Ansoff (ed.) *Business Strategy*, Harmondsworth: Penguin.

Hendricks, J. A. (1976). 'The impact of human resource accounting information on stock investment decisions: an empirical study'. *Accounting Review*, 51 (April): 292–305.

Hines, R. D. (1982). 'The usefulness of annual reports: the anomaly between the efficient markets hypothesis and shareholder surveys'. *Accounting and Business Research*, 32 (Autumn): 269–309.

Hines, T. (1991). 'The wider issues'. *Certified Accountant*, April: 38–41.

Holman, W. R., Randolph New, J. and Singer, D. (1985). 'The impact of corporate social responsiveness on shareholder wealth'. *Research in Corporate Social Performance and Policy*, 7: 137–152.

Ingram, R. W. (1978). 'An investigation of the information content of (certain) social responsibility disclosures'. *Journal of Accounting Research*, 16: 270–285.

Institute of Chartered Accountants of England and Wales (ICAEW), (1992). *Business, accountancy and the environment:*

a policy and research agenda, London: ICAEW Research Group.

International Institute for Sustainable Development, (1992). *Business strategy for sustainable development: leadership and accountability for the 90s*. Deloitte and Touche/BCSD.

KPMG (1997a). *International Survey of Environmental Reporting 1996*. KPMG Bohlins Environmental Advisors, March, Amsterdam: KPMG.

KPMG, (1997b). *KPMG Environmental Reporting 1996 Awards: Judges' Decisions and Comments*, Auckland, New Zealand: KPMG.

Lee, T. A. and Tweedie, D. P. (1975). 'Accounting information: an investigation of private shareholder understanding'. *Accounting and Business Research*, 5 (Winter): 3–17.

Lee, T. A. and Tweedie, D. P. (1976). 'The private shareholder: his sources of financial information and his understanding of reporting practices'. *Accounting and Business Research*, 6 (Autumn): 304–314.

Lewis, B. L., Schipper, K. and Zmijewski, M. (1992). 'The effects of missing information on security valuation'. Paper presented at Macquarie University Workshop in Accounting and Finance, 21 July.

Livingstone, J. L. (1972). 'A behavioural study of tax allocation in electric utility regulations'. *Accounting Review*, 47 (Oct): 679–692.

Mahapatra, S. (1984). 'Investor reaction to a corporate social accounting'. *Journal of Business Finance & Accounting*, 11 (1): 29–40.

Miller, H. (1997). 'Social and environmental disclosures and their relationships to measures of social and environmental performance'. *Unpublished Dissertation*, University of Otago, Dunedin, New Zealand.

Milne, M. J. (1992). 'Is the Act soft on polluters?'. *Terra Nova—the Resource Management Magazine of New Zealand*, (April): 34–37.

Mintzberg, H. (1983). 'The case for corporate social responsibility'. *The Journal of Business Strategy*, 4 (2): 3–15.

Oppenheim, A. N. (1992). *Questionnaire design, interviewing and attitude measurement*. London: Printer Publishers Ltd.

Ortman, R. F. (1975). 'The effects on investment analysis of alternative reporting procedure for diversified firms'. *Accounting Review*, 50 (April): 298–304.

Owen, D. L. (ed.), (1992). *Green reporting—accountancy and the challenge of the nineties*. London: Chapman and Hall.

Ramanathan, K. V. (1976). 'Toward a theory of corporate social accounting'. *Accounting Review*, 51 (July): 516–528.

Rockness, J. and Williams, P. F. (1988). 'A descriptive study of social responsibility mutual funds'. *Accounting, Organizations and Society*, 13 (4): 397–411.

Schuman, H. and Johnson, M. P. (1976). 'Attitudes and behaviour'. *Annual Review of Sociology*, 2: 161–207.

Shane, P. B. and Spicer, B. H. (1983). 'Market response to environmental information produced outside the firm'. *Accounting Review*, 58 (July): 521–538.

Sterling, R. R. (1972). 'Decision-oriented financial accounting'. *Accounting and Business Research*, 2 (Summer): 198–208.

Teoh, H. Y. and Shui, G. Y. (1990). 'Attitudes towards corporate social responsibility and perceived importance of social responsibility information characteristics in a decision context'. *Journal of Business Ethics*, 9: 71–77.

Ullmann, A. A. (1985). 'Data in search of a theory: a critical examination of the relationships among social performance, social disclosure, and economic performance of US firms'. *Academy of Management Review*, 10 (3): 540–557.

United Nations Commission on Transnational Corporations (UNCTC), (1991). Intergovernmental working group of experts on international standards of accounting and reporting, accounting for environmental protection measures, economic and social council, E/C 10A/C3/1991/5.

Verrecchia, R. (1983). 'Discretionary disclosure'. *Journal of Accounting and Economics*, 5 (December): 179–194.

Wiseman, J. (1982). 'An evaluation of environmental disclosures made in corporate annual reports'. *Accounting, Organisations and Society*, 7 (1): 53–63.

Yarwood, V. (1996). 'Time to remove the green tinted specs'. *Management Magazine (NZ)*. (December): 93–97.

Accounting and Business Research, Vol. 29. No. 4. pp. 281–298. 1999

Financial analysis, future earnings and cash flows, and the prediction of stock returns: evidence for the UK

Andreas Charitou and George Panagiotides*

Abstract—This study examines empirically whether fundamental analysis in the UK identifies equity values not currently reflected in stock prices and thus predicts excess returns. Similar to Ou and Penman (1989), the fundamental analysis undertaken combines a large set of financial statement information into one summary measure which indicates the direction of one-year-ahead earnings changes. Positions are taken in UK stocks on the basis of this measure during the period 1991–95, which involve cancelling long and short positions with zero net investment. This analysis is repeated i) for cash flows and ii) for earnings and cash flows together. The results of this study indicate that financial information predicts one year ahead earnings and cash flow changes, and that future earnings and cash flows are not fully impounded in stock prices. Results also indicate that an earnings-based trading strategy earns higher excess returns than a cash flow-based trading strategy.

1. Introduction

Economic theory attributes to earnings the role of a signal, optimally directing resource allocation in the capital markets. Equity valuation models, both theoretical and applied, employ expected earnings as an explanatory variable. Financial analysts express future expectations of securities in the form of earnings forecasts. Managerial decisions and their compensation are usually expressed in terms of earnings objectives (Dechow, 1994; Lev, 1989). Empirical research also provides substantial evidence of the usefulness of earnings in returns studies, in managerial compensation, and in predicting bankruptcy, beta, and bond ratings.[1] In recent years, there has been increased attention to cash flow reporting worldwide, partly because earnings measures have certain limitations. Regulatory bodies in the UK, USA, Canada and Australia advocate i) that information about cash flows in addition to earnings is useful in assessing share value, and ii) that earnings and cash flows are complementary measures of firm performance (ASB, FRS 1, 1991; FASB 95, 1987). Researchers provided also some empirical evidence that cash flows are valued in the marketplace beyond earnings (Livnat and Zarowin, 1990; Ali and Pope, 1995). Even though there has been increased attention to cash flow reporting, UK research on the usefulness of cash flows in the capital markets has been limited.

In predicting stock returns, Ou and Penman (1989) and Ou (1990) combined a large set of financial statement information into one summary measure which indicates the direction of one year ahead earnings changes. Their results showed that the earnings prediction model can be used to earn excess returns above those of a random strategy. Other US studies by Lev and Thiagarajan (1990), Holthausen and Larcker (1992), Charitou and Charalambous (1996), and Abarbanell and Bushee (1997) provide empirical evidence of the ability of financial statement information to predict earnings and excess returns. The findings of these studies provide new evidence and groundwork for future research.

---

*The authors are, respectively, at the University of Cyprus and University of Cyprus/Pricewaterhouse Coopers. They would like to thank the editor, K. Peasnell, two anonymous reviewers, C. Charalambous, P. Hadjicostas, G. Hadjinikolas, E. Karahanna-Evaristo, E. Liatsos, L. Trigeorgis, and N. Vafeas, for their insightful comments, and C. Louka for valuable research assistance. The paper has benefited from workshop participants at the American Accounting Association Conference, European Accounting Association Conference, University of Toronto and University of Cyprus. This project was partly supported by the Institute of Certified Public Accountants of Cyprus (PricewaterhouseCoopers, Arthur Andersen, KPMG, Pavlou and Poyiadgis, Ernst & Young; and Deloitte & Touche) and by the University of Cyprus. Remaining errors are the responsibility of the authors. Correspondence should be addressed to Professor Andreas Charitou, Department of Business Administration, University of Cyprus, P.O. Box 20537, Nicosia, CY 1678, Cyprus. Tel: 357-2-338763. Fax: 357-2-339063. email: charitou@atlas.pba.ucy.ac.cy. The final version of this paper was accepted in April 1999.

[1] Lev (1989), Cho and Jung (1991) and Lev and Ohlson (1982), among others, provide an in-depth review of the usefulness of earnings in capital markets research. See also Bauman (1996) for a review of fundamental analysis research.

To probe more into the existing research, we extend prior studies to determine whether future cash flows, in addition to earnings, are impounded in stock prices in the UK. We have been motivated to examine this issue using UK data i) because of the increased attention to cash flow reporting in the UK during the past few years,[2] ii) because of the inherent limitations of earnings measures (i.e., affected by arbitrary allocations, manipulated by managers), and iii) due to the fact that the UK capital markets are considered among the largest worldwide and no other study thus far has examined this issue using UK data.[3]

The major research question addressed in the present study is whether the UK market fully impounds in stock prices the future earnings and cash flow implications of current accounting disclosures. Our study differs from prior studies in that i) it uses the information derived from a cash flow prediction model to predict excess returns, ii) it combines the information derived from the earnings and cash flow prediction models to predict security returns, and iii) it uses a UK dataset of all industrial firms for the period 1984–1995. Our results indicate that financial information predicts one year ahead earnings and cash flow changes, and that future earnings and cash flows are not fully impounded in stock prices. Results also indicate that an earnings-based trading strategy earns higher excess returns than a cash flow-based trading strategy. These results corroborate prior US evidence by Ou (1990), Ou and Penman (1989) and Holthausen and Larcker (1992) which suggests that financial statements capture fundamentals that are not reflected in stock prices.

The paper proceeds as follows: Section two motivates the study; Section three describes the methodology; the empirical results are discussed in Section four; conclusions are presented in Section five.

2. Motivation for the study

The efficient market hypothesis (semi-strong form) states that all publicly available information is impounded in stock prices and therefore investors cannot gain excess returns (Fama, 1976). In contrast, whenever the intrinsic (fundamental) value or the investor's own estimate of a stock's true worth is below (above) the market price, the stock is considered undervalued (overvalued).[4] Even though fundamental analysis states that stock prices are derived from financial statement information, there is no theory linking financial information to firm value.

Recently, researchers employed trading strategies to determine whether financial information is impounded in stock prices. Ou and Penman (1989), Ou (1990), Lev and Thiagarajan (1990) and Abarbanell and Bushee (1997) designed a trading strategy that was based on the prediction of stock returns through the prediction of earnings from financial statement information partly because i) there exists strong evidence that earnings are valued positively by investors, and ii) there is a belief that expected dividends are paid out of earnings. The results of these studies indicate that financial statement information can be used to gain excess returns.

Specifically, Ou and Penman (1989) and Ou (1990) combined a large set of financial statement information into one summary measure which indicates the direction of one year ahead earnings changes. The 24-month holding period cumulative return of their strategy was about 12.5% over the period 1973–83.[5] Lev and Thiagarajan (1990) employed an investment strategy similar to Ou and Penman which was based on a binary variable derived from 13 accounting variables. They report an average annual abnormal return of about 6% to their investment strategy for the period 1974–88. Abarbanell and Bushee (1997) examined the underlying relations between accounting-based fundamental signals and stock prices. Based on associations between the individual signals and future earnings changes, they show that there is an economic justification for analysts and investors to rely on many fundamental signals when assessing future firm performance. Moreover, Holthausen and Larcker (1992) predicted excess returns directly from financial statement information for the period 1978–88. Their model also earned excess returns between 7.58% and 10% for the 24-

---

[2] The Accounting Standards Board (ASB) in the UK (FRS 1, 1991) also asserts that cash flow information gives an indication of the quality of earnings, and thus both earnings and cash flows are complementary measures of firm performance.

[3] Since the early cash flow studies of Lee (1981) and Lawson (1981), several researchers examined the usefulness of cash flows using UK data, among those, Clubb (1995), Arnold et al., (1991), Ali and Pope (1995), and Board and Day (1989). Moreover, recently the ASB issued a revised 'Cash flow statement' (1996).

[4] The intrinsic (fundamental) value of a stock is defined as the present value of all future expected dividends/cash flows to the investor discounted at the appropriate risk-adjusted interest rate.

[5] More specifically, Ou and Penman (1989) examined two estimation periods, 1965–72 and 1973–77. Twenty-eight variables were identified as earnings predictors in both periods. Sixteen (18) variables were significant in the first (second) estimation period. Only six variables appeared significant in both estimation periods. Thereafter, they extracted a summary measure from the financial statements that indicates the direction of one-year ahead earnings changes. Based on this measure, they took long and short positions with zero net investment during the period 1978–84. They assigned stocks to long positions for probabilities $Pr > 0.6$ and to short positions for stocks with $Pr < 0.4$.

month holding period.[6] In summary, prior studies provide evidence that financial statements capture fundamentals that are not reflected in stock prices.

The present study extends prior research by focusing on: i) the ability of financial statement information to predict unexpected changes in earnings and unexpected changes in cash flows, and ii) whether earnings and cash flow predictions are impounded in stock prices. We focus on cash flows because earnings can be manipulated by managers while the accruals component of earnings can be affected by arbitrary allocations.[7] To the extent that accruals can be manipulated, the cash flow component of earnings is expected to be a more reliable indicator of firm performance than the accruals component.[8] Moreover, under the 'quality of earnings' explanation, market prices are expected to react more to a given amount of cash flows than to the same amount of accruals because accruals represent only very indirect links to future cash flows (Bernard and Stober, 1989).[9] The ASB (1991) also asserts that cash flows give an indication of the quality of earnings and thus, both earnings and cash flows should be considered complementary measures of firm performance. Furthermore, the assertion made in prior studies that future dividends are 'paid out of earnings' may not be entirely valid since earnings is considered a profitability, not a liquidity, measure.

Charitou and Vafeas (1998) show that a positive relationship between cash flows and dividend changes exists due to liquidity and accruals management considerations. They also state that even if cash flows and accruals are equally valuable in measuring firm performance, cash flows should be more useful than accruals in predicting dividend changes and firm performance, since cash flows are a more direct liquidity measure.[10] On the other hand, cash flows have timing and matching problems, so they are considered a noisier measure of firm performance than earnings. Earnings mitigate timing problems in revenue recognition and in matching revenues with appropriate expenses in time. In the end, the role of cash flows in predicting stock returns is an open empirical question, and it is the primary focus of this study.

Because of the aforementioned limitations of earnings, this study examines whether a trading strategy based on both future earnings and cash flows can better predict stock returns. This issue will be examined by taking a long (short) position in a portfolio that contains firms that have a positive (negative) prediction for next year's earnings and also a positive (negative) prediction for next year's cash flow (see Figure 1). Moreover, in contrast to the prior US studies, our study uses UK data. Even though financial reporting practices in the UK and US have several similarities, the differences in financial reporting between the two countries reveal that the financial reporting system in the US is more conservative and less flexible than the UK system.[11] This leads to the reporting of higher earnings when UK GAAP is used.[12]

The role of such differences in the prediction of earnings and cash flow changes is not clear *a priori*. For example, as the rate of flexibility increases it may be easier for managers to manipulate earnings, and therefore, the predictive ability of accounting variables may be more limited. Of course, the predictor variables identified in the study are not expected to be the same as those identified in prior US studies because i) there exist differences in the financial reporting systems between the two countries, ii) there exist sample period differences, iii) there exist changing macro and micro-economic conditions, and iv) there exist differences in sample characteristics.[13]

---

[6] Holthausen and Larcker examined three different measures of excess returns and 60 potential predictor variables. Six predictor variables entered their models at least four times. In order to examine the predictive ability of their models they used 10 portfolios. They took long positions in portfolios 1 to 3 and short positions in portfolios 8 to 10, while portfolios 4 to 7 were excluded. The correct predictions were similar for the three measures of returns and fluctuated between 52.1% and 54.3%.

[7] Watts and Zimmerman (1978) report three reasons for manipulation of earnings by managers: (i) to increase their bonus awards (Healy, 1985) (ii) to avoid restrictive debt covenant violations and (iii) to reduce political cost. Because of the first and second reasons above, managers have an incentive to select income increasing methods while in the third case they have an incentive to reduce their income.

[8] Some financial analysts have also questioned the reliability and relevance of earnings primarily because of their accrual components (Wilson, 1987).

[9] There exists also evidence that cash flows are valued beyond earnings in the marketplace (Bowen et al., 1987; Ali and Pope, 1995).

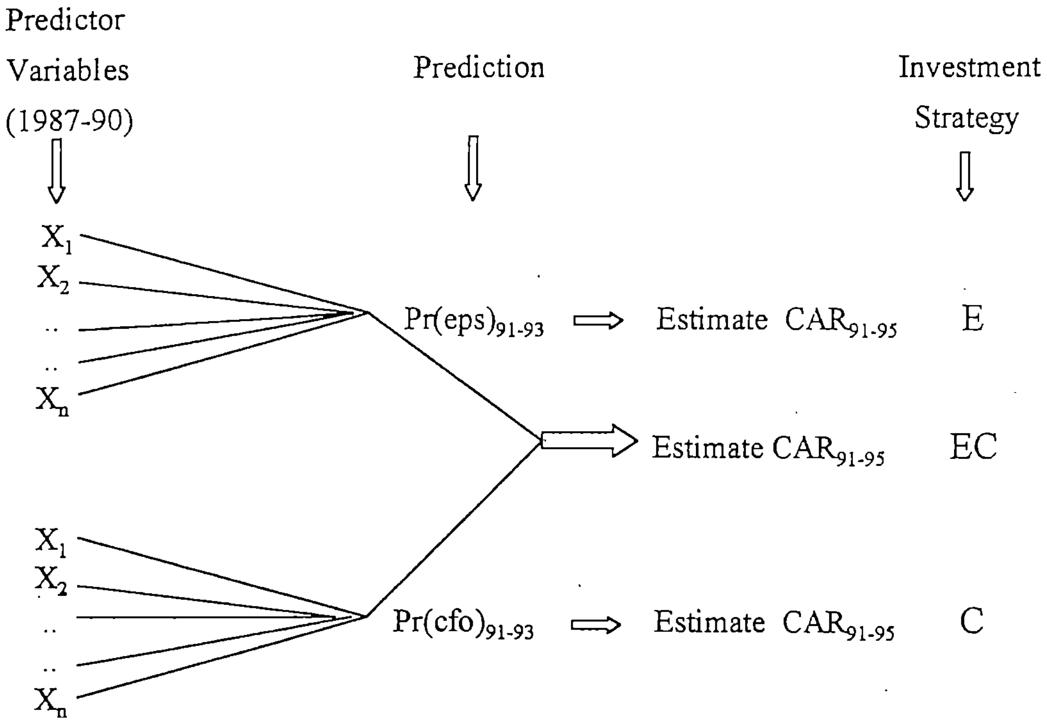
[10] Wilson (1987) also presents a 'liquidity' argument under which the market responds more favourably to cash flows than to accruals because high liquidity is a signal of a smaller likelihood of financial distress. Moreover, Bernard and Stober (1989), Bowen, Burgstahler and Daley (1986), Gombola and Ketz (1983), among others, support that cash flows are a more direct liquidity measure than earnings or earnings plus depreciation.

[11] Specific differences in financial reporting between the two countries relate mainly to (a) inventory valuation (b) research and development (c) goodwill (d) depreciation (e) foreign currency translation (f) taxation and (g) extraordinary items. (Nobes and Parker, 1995; Haskins, 1996).

[12] A survey by Weetman and Gray (1990) concludes that using UK GAAP increased earnings compared to the US GAAP of 16.6%, 9.1% and of 25.2% for years 1985, 1986 and 1987 respectively. Also, a study by Ernst & Young (1992) that used 39 UK companies registered with the SEC showed that 92% of the companies had negative effects on earnings when their results were adjusted to the US GAAP.

[13] It should be kept in mind that the major objective of this study is to determine whether financial statement information captures fundamentals that are not reflected in stock prices. Since there is no theory linking financial information to future earnings or cash flows, it is beyond the scope of this study to develop such a theory or to justify why certain predictor variables differ between the two countries.

Figure 1
Investment strategies



This figure depicts the three investment strategies undertaken in the present study. Financial statement information (Xs) for the period 1987–90 is used to extract a summary measure Pr which is an indicator of the direction of future earnings (eps) and cash flow (cfo) changes for the period 1991–93. If $Pr > 0.5$: probability of an eps or cfo increase; if $Pr < 0.5$: probability of an eps or cfo decrease.

Investment Strategies (Estimation of Cumulative Abnormal Returns, CAR):
E. *Based on EPS*
Long Position if $Pr(eps) > 0.5$; short position if $Pr(eps) < 0.5$[28]
C. *Based on CFO*
Long position if $Pr(cfo) > 0.5$; short position if $Pr < 0.5$
EC. *Based on both EPS and CFO*
Long Position if $Pr(eps) > 0.5$ and $Pr(cfo) > 0.5$; Short Position if $Pr(eps) < 0.5$ and $Pr(cfo) < 0.5$

[28]The Pr scheme 0.6,0.4 is also used for the trading strategies E and C

3. Methodology

The following sections describe i) the investment strategy, and ii) the dataset.

3.1. *The investment strategy*

The following procedures are followed in order to develop the investment strategy: a) measurement of the variables to be predicted; b) selection of predictor variables; c) calculation of the estimated summary value probability (Pr) measure; d) portfolio formation; and e) measurement of portfolio performance. A discussion of these procedures follows (see Figure 1).

3.1.1. *Measurement of the variables to be predicted*

Similar to Ou (1990) and Ou and Penman (1989) a logit model is employed for the period 1987–90 to predict the sign of the earnings (EPS) and cash flow (CFO) per share changes for each firm i in year t for the period 1991–93.

$$\Delta EPS_{it+1} = (EPS_{it+1} - EPS_{it}) - drift_{eps_{it}}$$
$$\Delta CFO_{it+1} = (CFO_{it+1} - CFO_{it}) - drift_{cfo_{it}}$$

where:

$drift_{eps_{it}} = (EPS_{it} - EPS_{it-2})/2$; $drift_{cfo_{it}} = (CFO_{it} - CFO_{it-2})/2$ (Ou, 1990, Ou and Penman, 1989).[14]

---

[14] Since the earnings and cash flow increases tend to be more than the decreases in these variables, the EPS and CFO vari-

EPS is defined as earnings per share before extraordinary items and discontinued operations. CFO is defined as operating cash flows per share[15]. The dichotomous realisation, Y_{it+1}, of the unobserved variable ΔEPS is defined as follows:

$$Y_{it+1} = 1 \text{ if } \Delta EPS_{it+1} > 0$$

$$Y_{it+1} = 0 \text{ if } \Delta EPS_{it+1} < 0$$

The dichotomous realisation, Y_{it+1}, of the unobserved variable ΔCFO is defined as follows:

$$Y_{it+1} = 1 \text{ if } \Delta CFO_{it+1} > 0$$

$$Y_{it+1} = 0 \text{ if } \Delta CFO_{it+1} < 0$$

3.1.2. Selection of predictor variables

The possible predictor variables are selected from a) the list of variables examined by Ou (1990); Ou and Penman (1989); Holthausen and Larcker (1992) and b) from additional earnings, non-earnings and cash flow variables reported in the literature[16]. The univariate logistic regression approach is used to identify the statistically significant predictor variables for the estimation period 1987–90 (Table 1).[17] These variables will enter a multivariate stepwise logistic regression.

3.1.3. Calculation of the estimated summary value probability (Pr) measure

The output of the multivariate logit model is an estimated probability of an EPS and CFO change in year t+1. Pr values are calculated for each stock for the three-year period 1991–93 (i.e., after the estimation period 1987–90). The estimated probability (Pr) of an EPS and CFO change ranges from 0 to 1. The Pr measure is an assessment of the relative ability of the firm to generate earnings and cash flows in the year t+1. $Pr > 0.5$ is a prediction of an EPS or CFO increase, and $Pr < 0.5$ is a prediction of an EPS or CFO decrease.

3.1.4. Portfolio formation

The estimated probability (Pr) measure will then be used to form four portfolios. Two portfolios are constructed based on the earnings prediction model and another two portfolios are constructed based on the cash flow prediction model as follows:

E+ consists of firms with a prediction of an earnings (EPS) increase in the subsequent year.

E− consists of firms with a prediction of an earnings (EPS) decrease in the subsequent year.

C+ consists of firms with a prediction of a cash flow (CFO) increase in the subsequent year.

C− consists of firms with a prediction of a cash flow (CFO) decrease in the subsequent year.

The portfolio E+(C+) consists of firms with a prediction of positive earnings (cash flow) changes, i.e., the model with a probability of an earnings or cash flow increase greater than 0.5 ($Pr > 0.5$), while the E−(C−) portfolio consists of firms with a prediction of an earnings or cash flow decrease ($Pr < 0.5$). Consistent with prior studies, we also use an alternative cut-off point where we include in the dataset firms with a probability of an earnings or cash flow increase greater than 0.6 and a probability of an earnings or cash flow increase of less than 0.4 ($0.4 > Pr > 0.6$).[18] Four additional portfolios are constructed using firms with a $Pr > 0.6$ for the E+(C+) portfolio and using firms with a $Pr < 0.4$ for the E−(C−) portfolio.[19]

Furthermore, in order to determine whether investment in a portfolio of stocks with predicted earnings and cash flow increases is more profitable than an investment in a portfolio of stocks with predicted earnings or cash flow increases, we divide our dataset into two additional portfolios: i) EC+ consists of firms with a prediction of an earnings and cash flow increase in the subsequent year; and ii) EC− consists of firms with a prediction of an earnings and cash flow decrease in the subsequent year. For example, the EC+ portfolio consists of firms that have a probability of earnings increase (derived from the earnings prediction model) greater than 0.5 ($Pr > 0.5$) and a prob-

---

ables are adjusted for drift to take out the firm-specific trend. However, the use of alternative drift terms does not alter the substance of the results.

[15] Cash flow from operations (CFO) = operating earnings adjusted for all non-current accruals not affecting working capital (e.g., depreciation, amortisation, deferred taxes, equity earnings), plus net changes in all working capital accounts, except for changes in cash, marketable securities and debt in current liabilities. Similar to Wilson (1986), Ali and Pope (1995), Bernard and Stober (1989), our definition of cash flows adjusts earnings for accruals (current and non-current) consistently across firms.

[16] Several capital market studies reported earnings and non-earnings variables as being useful in explaining security returns, including Wilson (1986), Lipe (1986), Bernard and Stober (1989), Strong and Walker (1993).

[17] Logarithmic transformation is used for some variables that are not originally normally distributed.

[18] In trading strategies investors have the option to include in their portfolios observations that show more clearly the direction of the earnings/cash flow change. In an attempt to get more robust results, observations with an estimated probability around 0.5 (i.e., between 0.4 and 0.6) are excluded from the dataset. Values of Pr between 0.4 and 0.6 may not indicate the direction of earnings/cash flow changes very well.

[19] To test even further the robustness of our results, we designed two additional strategies. First, by going long in firms with an earnings $Pr > 0.5$ and an CFO $Pr > 0.3$ and short in those firms with an earnings $Pr < 0.5$ and an CFO $Pr < 0.7$. Second, by going long in firms with an earnings $Pr > 0.6$ and an CFO $Pr > 0.4$ and by going short in those firms with an earnings $Pr < 0.4$ and an CFO $Pr < 0.6$. The results of these alternative trading strategies are discussed in the next section. We thank an anonymous referee for suggesting these alternative trading strategies.

P 10,608

ability of a CFO increase (derived from the CFO prediction model) greater than 0.5 ($Pr > 0.5$). The opposite applies to the EC− portfolio (see Figure 1).[20]

3.1.5. *Measurement of portfolio performance*

Using cumulative abnormal returns (CAR), we calculate each portfolio's performance for each month for the five-year period 1991–95. Each month's abnormal return (AR_{it}) is the difference between actual return (R_{it}) and expected return $E(R_{it})$.

$$CAR_t = \Sigma AR_{it}$$

$$AR_{it} = R_{it} - E(R_{it})$$

$$R_{it} = \frac{P_{it} - P_{i,t-1} + Div_{it}}{P_{i,t-1}}$$

where:
P_t: is the market value of equity at the end of the month t; Div_t: cash dividends for the month t. Expected returns are based on the market model using monthly data for 48 months prior to the month under consideration. The regression model is:

$$E(R_t) = a + b\ R_{mt}$$

where R_t is the monthly mean return of each portfolio; R_m is the monthly return of the market portfolio; *a* and *b*: predicted intercept and beta coefficients, respectively, which are estimated for each month.

Our investment strategy is based on a 12-month holding period ending three months after the fiscal year end, since it is expected that most financial information will be available to the market participants by that time. We assign stocks to a long position if the model predicts an earnings or a cash flow increase ($Pr > 0.5$ or $Pr > 0.6$) and we assign stocks to a short position if the model predicts an earnings or a cash flow decrease ($Pr < 0.5$ or $Pr < 0.4$). The CAR is calculated for the hedge portfolio which is a zero net investment strategy, i.e., the money investors get by going short in stocks with $Pr < 0.5$ (or $Pr < 0.4$) is used to buy stocks (long position) with a $Pr > 0.5$ (or $Pr > 0.6$).[21]

Positions are taken on the basis of Pr values at the first day of the fourth month after fiscal year end (i.e., April 1 for a December fiscal year end firms) for the period 1991–93. For each month in the investment position, the return to the hedge portfolio is the difference between mean returns of the long and short positions ($CAR_{hedge} = CAR_{long} - CAR_{short}$). Reported returns for each month in the 12-month holding period are means of returns to the investment strategy over the five-year period 1991–95, and therefore reflect the average probability for the investment strategy implemented each year.

CARs for the hedge, long, and short investment positions will be estimated twice for Pr 0.5,0.5 and Pr 0.4,0.6, for each of the three investment strategies (i.e., the earnings-based; the cash flow-based; and the combined earnings/cash flow-based strategies).

3.2. *The data set*

The data set consists of all UK industrial firms included in the Global Vantage database (1995 version) for which data are available to estimate all variables used in the study for the ten-year period 1984–93 (see Table 1). Data for the four-year period 1987–90 are used to estimate the earnings and cash flow prediction (logit) models. These prediction models are used to predict one-year ahead earnings and cash flow changes for the three year period 1991–93. Data for the five-year period 1991–95 are used to estimate cumulative returns. Data for the period 1984–86 are used to calculate the drift and the lagged terms. The data set consists of 3,256 (3,088) firm-year observations for the earnings (cash flow) prediction model for the four-year period 1987–90.[22]

4. Empirical results

This study i) assesses the ability of financial statements to predict earnings and cash flow changes and ii) examines whether the prediction of earnings and cash flow changes one year ahead is already impounded in stock prices. We use data for the four-year period 1987–90 to estimate the earnings and cash flow prediction logit models. Table 1 lists the 60 accounting variables used in the present study as well as those variables that were found statistically significant in the univariate and multivariate analysis. Initially, we performed univariate analysis for each of the 60 possible predictor variables. Thirteen (21) variables were found statistically significant in predicting earnings (cash flows). In the parts which follow we discuss i) the multivariate analysis undertaken in order to identify the predictor variables for the one-year ahead

---

[20] Even though our study was originally designed to estimate CAR based on the Pr 0.6,0.4 scheme for the combined portfolio of earnings and cash flows, we were unable to perform this test because only a limited sample of firms met this criterion.

[21] In practice it is not a zero net investment since there are transaction costs.

[22] The Global Vantage (GV) database includes data for the period 1984–95, and we used all available data for this study (monthly market data for the years 1994–95 were collected from the 1997 version of the GV). Financial institutions (SIC 6,000–6,999), utilities (SIC 4,800–4,999) and other non-industrial firms (SIC greater than 8,000) are excluded from the sample.

Table 1
Significant accounting variables in the present and in prior earnings and cash flow prediction studies

Variable number	*Accounting variable*	*Abbreviation*	*Present Study (a)*				*Ou & Penman (1989)*				*Ou (1990)*	*Holthausen & Larcker (92)*	*Charitou & Charalambous (96)*	
			Earnings prediction models		*Cash flow prediction model*		*1965 to 1972*		*1973 to 1977*		*1965 to 1977*	*1978 to 88*	*1982 to 1986*	
			Univariate	*Multivariate*	*Univariate*	*Multivariate*	*Univariate*	*Multivariate*	*Univariate*	*Multivariate*	*Multivariate*	*Multivariate*	*Multivariate*	
													All firms	*Manufacturing*
1	Current ratio	CR												
2	% D in CR	DCR							x	x		x	x	x
3	Quick ratio	QR			x									
4	% D in QR	DQR	x		x		x		x	x		x	x	x
5	Days in Acc. Receiv.	DIAR			x	x								
6	% D in DIAR	DDIAR			x	x								
7	Invent. Turnover	IT							x					
8	% D in IT	DIT					x	x	x					
9	Invent. to T. Assets	ITTA			x	x			x	x	x			
10	% D in ITTA	DITTA			x	x	x	x	x	x			x	
11	% D in Inventory	DII			x		x		x	x				
12	% D in Sales	DIS					x		x	x				
13	% D in Depreciation	DID					x	x	x		x		x	x
14	D in Divid. per Share	DIDPS					x	x	x	x	x		x	x
15	Depr. to plant assets	DTPA			x		x		x			x		
16	% D in DTPA	DDTPA			x		x	x	x			x	x	x
17	Ret on Opening Equity	ROE	x				x		x		x			
18	% D in Roe	DROE	x						x	x	x			
19	% D in Cap. Exp. to TA	DICETA					x	x	x		x		x	
20	DICETA (one year lag)	LDICETA					x	x	x	x	x			

Table 1 (continued)
Significant accounting variables in the present and in prior earnings and cash flow prediction studies

Variable number	*Accounting variable*	*Abbreviation*	*Present Study (a)*				*Ou & Penman (1989)*				*Ou (1990)*	*Holthausen & Larcker (92)*	*Charitou & Charalambous (96)*	
			Earnings prediction models		*Cash flow prediction model*		*1965 to 1972*		*1973 to 1977*		*1965 to 1977*	*1978 to 88*	*1982 to 1986*	
			Univariate	*Multivariate*	*Univariate*	*Multivariate*	*Univariate*	*Multivariate*	*Univariate*	*Multivariate*	*Multivariate*	*Multivariate*	*Multivariate*	
													All firms	*Manufacturing*
21	Debt to Equity Ratio	DTER			x		x		x	x				x
22	% D in DTER	DDTER					x	x	x					
23	LT Debt to Equity	LTDE			x		x							
24	Equity to Fixed Assets	EFTA										x		
25	Sales to T. Assets	STTA							x					
26	% D in STTA	DSTTA			x	x	x	x	x		x			
27	Return on T. Assets	ROTA	x	x	x		x	x	x	x			x	x
28	% change in the ROTA	DROTA	x											
29	Ret. on closing Equity	ROCE	x				x	x	x	x				
30	Gross Margin Ratio	GMR					x	x					x	x
31	Oper. Pr (Bef Dep) to sales	OPS	x				x		x					
32	% D in OPS	DOPS	x	x	x	x								
33	Pretax Inc. to T. Sales	PITS					x		x					
34	% D in PITS	DPITS							x	x				
35	Net Profit Margin	NPM					x		x					
36	% D in NPM	DNPM	x											
37	Sales to Total Cash	STC							x	x				
38	Sales to Acc. Rec.	SAR	x	x										
39	Sales to Inventory	STI			x	x								
40	% D in STI	DSTI					x		x					x

Table 1 (continued)
Significant accounting variables in the present and in prior earnings and cash flow prediction studies

Variable number	*Accounting variable*	*Abbreviation*	*Present Study (a)*				*Ou & Penman (1989)*				*Ou (1990)*	*Holthausen & Larcker (92)*	*Charitou & Charalambous (96)*	
			Earnings prediction models		*Cash flow prediction model*		*1965 to 1972*		*1973 to 1977*		*1965 to 1977*	*1978 to 88*	*1982 to 1986*	
			Univariate	*Multivariate*	*Univariate*	*Multivariate*	*Univariate*	*Multivariate*	*Univariate*	*Multivariate*	*Multivariate*	*Multivariate*	*Multivariate*	
													All firms	*Manufacturing*
41	% D in SWC	DSWC												
42	Sales to Fixed Assets	SFA												
43	% D in Total Assets	DITA			x		x		x	x				
44	Cash Flow to Total Debt	CFFOTD					x	x	x			x		
45	% change to CFFOTD	DCFFOTD												
46	WC to Total Assets	WCTA							x	x				
47	Oper Inc. to T. Assets	OPITA	x		x	x	x	x	x	x				
48	% D in OPITA	DOPITA												
49	Rep of LTD as % TLTD	ROLTD					x	x	x	x				
50	% D in LTD	DLTD			x									
51	Cash Div as % of CF	CDOCF					x	x						
52	Net Income over CF	NIOCF												
53	% D in Cash Flow from Oper.	DCFFO												
54	CFFO to Current Liabilities	CFFOCL	x		x									
55	% D in CFO to Curr. Liab.	DCFFOCL												
56	CFFO to LTD	CFFOLTD												
57	% D in CFFO to LTD	DCFFOLTD												
58	CFFO to receivables & invent.	CFFORI			x									
59	CFFO to total liabilities	CFOTL	x	x	x	x								
60	% change to CFFOTL	DCFFOTL												
Total Number of statistically significant variables		Univariate Multivariate	13	4	21	9	28	16	33	18	8	6	9	9

earnings and cash flow changes, and ii) the usefulness of the one-year ahead earnings and cash flow changes in predicting stock returns.

4.1. *Multivariate analysis*

In this section we discuss the multivariate analysis undertaken for predicting one-year ahead i) earnings changes and ii) cash flow changes.

4.1.1. *Earnings prediction model*

The 13 accounting variables that were found significant in predicting one year ahead earnings changes in the univariate analysis are used in the multivariate model. By employing the stepwise regression procedure, the following four accounting variables were found statistically significant in predicting earnings per share changes one year ahead (Table 3): i) the return on total assets (ROTA), ii) the % change in operating profit to sales (DOPS), iii) the sales to accounts receivables ratio (SAR) and iv) cash flows to total liabilities (CFOLT). Consistent with prior studies by Ou (1990), Ou and Penman (1989), and Freeman et al., (1982) the profitability ratios are negatively related to future earnings changes. Regarding the ROTA variable, the literature supports that rates of return follow a mean reverting process (Freeman et al., 1982). Low rates of return imply that earnings are temporarily depressed and high rates of return imply that earnings are unusually good. The remaining two ratios are positively related to earnings changes, implying that any increases in the CFOLT and SAR ratios would lead to increases in future earnings. The sign of these ratios is consistent with the notion that i) firms with high CFOLT ratios are expected to experience fewer liquidity problems, and ii) increases in efficiency (proxied by SAR) will lead to higher future earnings.

Results in Table 4 indicate that the multivariate model predicts correctly 61% (67%) earnings changes for a Pr 0.5,0.5 (Pr 0.6,0.4) scheme. The annual correct earnings predictions range from 0.60 to 0.63 (0.66 to 0.70). The correct earnings increases are 0.63 (0.72) for a Pr 0.5,0.5 (Pr 0.6,0.4) and the correct earnings decreases are 0.60 (0.63). These prediction results are consistent with prior US evidence presented in Table 2, where we show that for a cut-off point of Pr 0.5,0.5 the correct predictions of prior studies range from 0.58 to 0.62, while for a cut-off point of Pr 0.6,0.4 the correct predictions range from 0.64 to 0.68. These results are consistent with the notion that the differences in GAAP between the UK and the US are not influencing the predictive ability of financial statements. The financial reporting differences may affect the financial ratios that appear significant in predicting earnings, but do not necessarily affect the prediction rate. In contrast to prior US models, our UK model is more parsimonious in that it gives at least as good prediction results as those results presented in prior studies while using four predictor variables versus at least nine predictor variables employed in prior studies.

4.1.2. *Cash flow prediction model*

The 21 accounting variables that were found statistically significant in predicting one-year ahead cash flow changes in the univariate analysis are used in the multivariate model. In Table 3 we present the nine statistically significant variables which are: i) days in account receivables (DIAR), ii) % change in days in accounts receivables (DDIAR), iii) inventory to total assets ratio (ITTA), iv) % change in the inventory to total assets (DITTA), v) % change in the operating profit margin (DOPS), vi) % change in sales to total assets (DSTTA), vii) sales to inventory ratio (STI), viii) operating cash flows to total liabilities (CFOLT), ix) operating profit to total assets ratio (OPITA). The level of the operating efficiency ratios (DIAR and ITTA) is positively related to cash flow changes, whereas the changes of these variables are negatively related to cash flow changes. These results may be due to the fact that increases in these variables may require greater cash outflows or lower cash inflows. Increases in the profitability ratio OPITA may lead to increases in CFO, since higher profits are expected to increase future CFO. The CFOLT and the STI variables are negatively related to cash flow changes. The cash flow variable CFOLT is inversely related to next year's CFO changes partly because cash flows tend to follow a mean reverting process.

Results in Table 4 show that the cash flow model predicts correctly 73% (79%) cash flow changes under the cut-off Pr 0.5, 0.5 (Pr 0.6,0.4) schemes. The annual correct cash flow predictions range from 0.69 to 0.75 (0.76 to 0.81). The correct cash flow increases are 0.70 (0.76) for a Pr 0.5,0.5 (Pr 0.6,0.4) scheme, and the correct cash flow decreases are 0.75 (0.80). These results indicate that the predictive ability of the CFO model is superior to the predictive ability of the earnings prediction model. This difference in the prediction rate is consistent with earnings being affected by arbitrary allocations, and/or earnings being more vulnerable to being manipulated by managers than cash flows.

4.2. *Predicting stock returns*

The major question raised in the present study is whether the prediction of earnings and cash flow changes provides new information which is not reflected in stock prices. Tables 5 and 6 report the empirical results from the three trading strategies implemented in the study. These strategies are

Table 2
Summary of correct predictions of the present and prior studies

	Ou & Penman (1989)				*Ou (1990)*		*Holthausen & Larcker (1992)*				*Charitou & Charalamous (1996)*		*Present Study*	
Estimation period	1965–72		1973–77		1965–77		1973–77		1978–82		1982–86		1987–1990	
Prediction over	1973–77		1978–83		1978–83		1978–88		1983–88		1987–91		1991–1993	
Cut–off point (Pr)	0.5,0.5	0.6,0.4	0.5,0.5	0.6,0.4	0.5,0.5	0.6,0.4	0.5,0.5	0.6,0.4	0.5,0.5	0.6,0.4	0.5,0.5	0.6,0.4	0.5,0.5	0.6,0.4
Correct predictions	0.62	0.67	0.60	0.67	0.61 0.58 0.58	0.68(a) 0.64(b) 0.68(c)	0.521 0.6(d)	0.543 0.65(d)	0.60	0.65	0.60 0.59(d) 0.62(f)	0.65 0.68(f)	0.61 0.73(e)	0.67 0.79(e)

(a, b, c): represent the three models (1, 2, 3) shown in the Ou (1990) study
(d): replication results for Ou and Penman (1989)
(e): cash flow predictions
(f): results using manufacturing data

Table 3
Summary of multivariate logit earnings and cash flow prediction models
Estimation period is 1987–1990

Predictor variable	*Abbreviation*	*Earnings prediction models ($N=3256$)*		*Cash flow prediction models ($N=3088$)*	
		coefficient	*p–value*	*coefficient*	*p–value*
Operating cash flows to total liabilities	*CFOLT*	*0.7065***	*0.0122*	−7.4621***	*0.00*
Days in accounts receivable	DIAR			−0.0038**	*0.0404*
% change in DIAR	DDIAR			0.4690***	*0.0015*
% change in op. profit margin	DOPS	−0.9810***	*0.00*	−0.4740**	*0.0306*
% change in sales to assets	DSTTA			−1.9980***	*0.00*
% change in the inventory/ assets	DITTA			2.1182***	*0.00*
Return on total assets	ROTA	−6.0242***	*0.00*		
Inventory to total assets	ITTA			−3.1763***	*0.00*
Operating profit/total assets	OPITA			9.7335***	*0.00*
Sales to receivables	SAR	0.0028*	*0.0772*		
Sales to inventory	STI			−0.0087***	*0.0066*

***,**,*: statistically significant at a = 0.01, 0.05 and 0.10, respectively

Table 4
Multivariate earnings and cash flow prediction models

	Earnings prediction models ($N=3256$)		*Cash flow prediction models ($N=3088$)*	
	Pr cutoff		Pr cutoff	
	0.5, 0.5	0.6, 0.4	0.5, 0.5	0.6, 0.4
% of correct predictions:				
1991	0.63	0.66	0.75	0.81
1992	0.60	0.66	0.69	0.76
1993	0.60	0.70	0.74	0.78
Total (average)	0.61	0.67	0.73	0.79
% correct predicted earnings or cash flow per share *increases*	0.63	0.72	0.70	0.76
% correct predicted earnings or cash flow per share *decreases*	0.60	0.63	0.75	0.80

Summary of prediction performance of earnings and cash flow prediction models for the period 1991–93 (training period is 1987–90). Earnings and cash flow changes are predicted one year ahead on the basis of an estimated probability (Pr) of an earnings or cash flow increase indicated by the prediction models.

Table 5

Panel A: Cut–off point 0.5, 0.5

Portfolio	*1991*	*1992*	*1993*	*1994*	*1995*	*Average*
+*E91*	−*4.49(L)*	*9.76(P)*	*8.64(P)*			*4.63(P)*
−*E91*	*3.19(L)*	−*4.61(P)*	−*6.15(P)*			−*2.52(P)*
Hedge	−*7.68(L)*	*14.37(P)*	*14.79(P)*			**7.15(P)**
+*C91*	−*6.64(L)*	−*2.18(L)*	*3.64(P)*			−*1.72(L)*
−*C91*	*3.02(L)*	*2.2(L)*	−*4.39(P)*			*0.27(L)*
Hedge	−*9.66(L)*	−*4.38(L)*	*8.03(P)*			−**1.99(L)**
+*E92*		*7.34(P)*	*9.72(P)*	*6.45(P)*		*7.83(P)*
−*E92*		−*7.27(P)*	−*12.06(P)*	−*5.85(P)*		−*8.39(P)*
Hedge		*14.61(P)*	*21.78(P)*	*12.30(P)*		**16.22(P)**
+*C92*		*4.13(L)*	*4.83(P)*	*5.35(P)*		*4.77(P)*
−*C92*		*2.5(L)*	−*3.86(P)*	−*1.98(P)*		−*1.11(P)*
Hedge		−*6.63(L)*	*8.69(P)*	*7.33(P)*		**5.88(P)**
+*E93*			*7.86(P)*	*10.03(P)*	*5.68(P)*	*7.85(P)*
−*E93*			−*2.85(P)*	−*9.14(P)*	−*5.35(P)*	−*5.78(P)*
Hedge			*10.71(P)*	*19.17(P)*	*11.03(P)*	**13.63(P)**
+*C93*			−*0.39(L)*	*2.63(P)*	*2.19(P)*	*1.47(P)*
−*C93*			−*2.18(P)*	−*1.75(P)*	−*1.29(P)*	−*1.74(P)*
Hedge			*1.79(P)*	*4.38(P)*	*3.48(P)*	**3.21(P)**

Panel B: Cut–off point 0.6, 0.4

Portfolio	*1991*	*1992*	*1993*	*1994*	*1995*	*Average*
+*E91*	*0.33(P)*	*19.25(P)*	*11.8(P)*			*10.46(P)*
−*E91*	*4.03(L)*	−*8.72(P)*	−*10.22(P)*			−*4.97(P)*
Hedge	−*3.7(L)*	*27.97(P)*	*22.02(P)*			**15.43(P)**
+*C91*	−*9.03(L)*	*0.16(P)*	*5.78(P)*			−*1.03(L)*
−*C91*	*5.63(L)*	*0.99(L)*	−*5.47(P)*			*0.38(L)*
Hedge	−*14.66(L)*	−*0.83(L)*	*11.25(P)*			−**0.64(L)**
+*E92*		*17.86(P)*	*15.1(P)*	*13.65(P)*		*15.53(P)*
−*E92*		−*4.09(P)*	−*19.75(P)*	−*9.77(P)*		−*11.20(P)*
Hedge		*21.95(P)*	*34.85(P)*	*23.42(P)*		**26.73(P)**
+*C92*		−*5.4(L)*	−*0.34(L)*	*5.47(P)*		*0.09(P)*
−*C92*		*4.79(L)*	−*2.89(P)*	−*2.14(P)*		−*0.08(P)*
Hedge		−*10.19(L)*	*2.55(P)*	*7.61(P)*		**0.17(P)**
+*E93*			*13.66(P)*	*18.34(P)*	*10.33(P)*	14.11(P)
−*E93*			−*9.42(P)*	−*9.19(P)*	−*5.74(P)*	−8.11(P)
Hedge			*23.08(P)*	*27.53(P)*	*16.07(P)*	**22.22(P)**
+*C93*			*8.52(P)*	*1.38(P)*	*1.12(P)*	*3.67(P)*
-*C93*			−*1.55(P)*	−*2.36(P)*	−*1.94(P)*	*1.95(P)*
Hedge			*10.07(P)*	*3.74(P)*	*3.06(P)*	**5.62(P)**

Mean cumulative monthly excess returns from investment in stocks on the basis of estimated probability of an earnings (E) and cash flow (C) increase (Pr) for the period 1991–95. Long positions (+E, +C, and +EC) are taken in all stocks with Pr>0.6 or Pr>0.5 and short positions (−E, −C and −EC) in all stocks with Pr<0.4 or Pr<0.5. with zero net investment. Reported returns are mean differences for the holding month between mean cumulative returns of the two sides of the positions.

Table 6

Panel A: Long positions are taken in all stocks with Pr > 0.5 and short positions in stocks with Pr < 0.5

Portfolio	*1991*	*1992*	*1993*	*1994*	*1995*	*Average*
+EC91	*−10.53(L)*	*7.94(P)*	*15.53(P)*			*4.31(P)*
-EC91	*6.68(L)*	*−2.96(P)*	*−9.54(P)*			*−1.94(P)*
Hedge	*−17.21(L)*	*10.9(P)*	*25.07(P)*			**6.25(P)**
+EC92		*7.45(P)*	*9.79(P)*	*0.28(P)*		*5.84(P)*
−EC92		*−0.58(P)*	*−6.15(P)*	*1.11(L)*		*1.49(P)*
Hedge		*8.03(P)*	*15.94(P)*	*−0.83(L)*		**7.71(P)**
+EC93			*9.79(P)*	*14.02(P)*	*8.61(P)*	*10.81(P)*
−EC93			*−6.15(P)*	*−6.75(P)*	*−4.05(P)*	*−5.65(P)*
Hedge			*15.94(P)*	*20.77(P)*	*12.66(P)*	**16.46(P)**

Panel B: Long positions are taken in all stocks with earnings Pr > 0.5 and a cash flow Pr > 0.3 and short positions in stocks with an earnings Pr < 0.5 and cash flow Pr < 0.7

Portfolio	*1991*	*1992*	*1993*	*1994*	*1995*	*Average*
+EC91	*−9.71(L)*	*11.19(P)*	*16.53(P)*			*6.00(P)*
-EC91	3.84(L)	−4.27(P)	−7.99(P)			*2.81(P)*
Hedge	−13.55(L)	15.46(P)	24.52(P)			**8.81(P)**
+EC92		*6.78(P)*	*12.63(P)*	*6.85(P)*		*8.75(P)*
-EC92		*−8.66(P)*	*−11.7(P)*	*−9.43(P)*		*−9.93(P)*
Hedge		15.44(P)	24.33(P)	16.28(P)		**18.68(P)**
+EC93			*9.23(P)*	*10.43(P)*	*7.2(P)*	*8.95(P)*
-EC93			*−8.85(P)*	*−10.39(P)*	*−4.09(P)*	*−7.78(P)*
Hedge			18.08(P)	20.82(P)	11.29(P)	**16.73(P)**

Panel C: Long positions are taken in all stocks with earnings Pr > 0.6 and a cash flow Pr > 0.4 and short positions in stocks with an earnings Pr < 0.4 and cash flow Pr < 0.6

Portfolio	*1991*	*1992*	*1993*	*1994*	*1995*	*Average*
+EC91	*−9.81(L)*	*10.27(P)*	*16.73(P)*			5.73(P)
-EC91	*4.64(L)*	*−4.82(P)*	*−8.84(P)*			3.01(P)
Hedge	−14.45(L)	15.09(P)	25.57(P)			**8.74(P)**
+EC92		*7.8(P)*	*14.57(P)*	*9.74(P)*		*10.70(P)*
-EC92		*−8.8(P)*	*−12.16(P)*	*−9.71(P)*		*10.22(P)*
Hedge		16.6(P)	26.73(P)	19.45(P)		**20.93(P)**
+EC93			*9.21(P)*	*11.83(P)*	*8.04(P)*	*9.69(P)*
-EC93			*−8.72(P)*	*−10.5(P)*	*−4.18(P)*	*−7.80(P)*
Hedge			17.93(P)	22.33(P)	12.22(P)	**17.49(P)**

Mean cumulative monthly excess returns from investment in stocks on the basis of estimated probability of an earnings (E) and cash flow (C) increase (Pr) for the period 1991–95. Reported returns are mean differences for the holding month between mean cumulative returns of the two sides of the positions.

based on the summary measure Pr from i) the prediction of earnings changes, ii) the prediction of cash flow changes, and iii) the prediction of both earnings and cash flow changes (see Figure 1).

4.2.1. Prediction of stock returns based on future earnings changes

Table 5 presents abnormal returns for the long and short positions and for the hedge portfolio based on the prediction of one-year ahead earnings changes. Our trading strategy is based on a twelve-month holding period over the years 1991–95. Two cut-off schemes are used, Pr 0.6,0.4 and Pr 0.5,0.5.[23] For sensitivity analysis purposes, each one of those cut-off schemes is tested three times, using three alternative 36-month holding periods, i.e., 1991–93, 1992–94 and 1993–95. Panels A and B of Table 5 present the results of the Pr 0.5,0.5 and Pr 0.6,0.4 trading strategies, respectively. The results of the Pr 0.6,0.4 scheme show that the average excess return is 15.43%, 26.73% and 22.22% for the three-year period 1991–93, 1992–94 and 1993–95, respectively (or average annual excess return of 21.46% over the period 1991–95). More specifically, in eight out of the nine 12-month holding period tests that we performed, our results show positive excess returns. Moreover, the excess returns over all our 24-month and 36-month holding periods were positive. Furthermore, the results of the Pr 0.5,0.5 trading strategy over the same period were consistent with the results of the Pr 0.6,0.4 trading strategy. In all three periods examined, the average excess returns ranged from 7.15% (1991–93) to 16.22% (1992–94). In summary, all earnings-based tests we performed provide evidence that excess returns can be earned. Our results are also consistent with the evidence provided by Ou and Penman, who reported 14.53% (8.3%) excess returns for the 24-month (12-month) holding period.

---

[23] By using the cut-off Pr 0.6,0.4 scheme, we eliminate firms whose sign for next year's earnings (or CFO) changes may not be indicated clearly (Pr values between 0.4 and 0.6). On the other hand, by using the cut-off Pr 0.5,0.5 scheme, the number of firms included in the analysis is larger and thus the variance of the portfolio returns would be lower.

4.2.2. Prediction of stock returns based on future cash flow changes

Table 5 presents abnormal returns for the long and short positions and for the hedge portfolio based on one-year ahead cash flow changes. Similar to the earnings-based trading strategy presented in the previous part, our trading strategy is based on a 12-month holding period over the years 1991–95. Two cut-off points are used, Pr 0.6,0.4 and Pr 0.5,0.5. Each of those cut-off schemes is tested three times using a 36-month holding period, i.e., 1991–93, 1992–94 and 1993–95. Panels A and B of Table 5 present the results of the Pr 0.5,0.5 and Pr 0.6,0.4 trading strategies, respectively. The results of the Pr 0.6,0.4 scheme show that the average excess return is −0.64%, 0.17% and 5.62% for the three-year periods, 1991–93, 1992–94 and 1993–95, respectively (or average annual excess return of 1.717% over the period 1991–95). Moreover, the results of the Pr 0.5,0.5 trading strategy over the same period were consistent with the results of the Pr 0.6,0.4 trading strategy. In all three periods examined the average excess returns ranged from −1.99% (1991–93) to 5.88% (1992–94). The average annual excess return of those three investment periods is 2.37%.

In summary, by comparing the cash flow-based prediction results with the earnings-based prediction results we observe that the one-year ahead earnings predictions provide additional information to the market and thus investors may earn excess returns. In contrast, the cash flow-based trading strategies do not provide conclusive evidence that excess returns can be earned, even though the correct prediction rates of the multivariate models was higher for the cash flow model (79% vs 67% for the Pr 0.6,0.4 scheme). Two plausible explanations may be given for these results. First, our cash flow prediction method performs equally well as other existing cash flow prediction models. Second, the cash flow information may be already impounded in stock prices.

4.2.3. Prediction of stock returns based on future earnings and cash flow changes together

Another trading strategy that we have undertaken is based on the summary value measures Pr extracted from the combined earnings and cash flow-based prediction models. Since both earnings and cash flows are considered measures of firm performance that may complement each other, we hypothesise that a trading strategy based on both earnings and cash flows will outperform the previous strategies that we examined which were based on either earnings or cash flow changes.[24] Similar to all our previous trading strategies, we use a 12-month holding period for the five-year period 1991–95 and a cut-off point of Pr 0.5,0.5. Again, for sensitivity analysis purposes, we test this cut-off scheme three times using a 36-month holding period, i.e., 1991–93, 1992–94 and 1993–95. Panel A of Table 6 presents abnormal returns for the long and short positions and for the hedge portfolio. The results show that the average annual excess return is 6.25%, 7.71% and 16.46% for the three-year periods 1991–93, 1992–94 and 1993–95, respectively (or average annual excess return of 10.14% over the period 1991–95).

More specifically, in eight out of nine 12-month holding period tests that we performed, the results indicate that there exist positive excess returns. Moreover, the excess returns over the 24-month and 36-month holding periods tested were positive (except once under the 24-month period). In summary, all combined earnings and cash flow-based tests that we performed provide evidence that excess positive returns can be earned. Furthermore, in order to test the robustness of our models, we have undertaken a random strategy that was repeated 1,000 times. The relative frequency of observing the 24-month CAR or greater was $p < 0.002$. These results are consistent with the evidence provided by Ou and Penman (1989) and they strengthen the evidence provided by our trading strategy.

Comparing the aforementioned results with the evidence provided from the earnings or cash flow prediction models alone we observe the following: i) the earnings-based and the combined earnings/cash flow-based trading strategies clearly outperform the cash flow-based trading strategy, and ii) the earnings-based trading strategy outperforms the combined earnings/cash flow-based trading strategy in two out of the three 36-month holding periods tested.[25]

---

[24] Under this trading strategy, firms must meet simultaneously the earnings and cash flow criteria (Pr 0.5,0.5 or Pr 0.6,0.4). Since under this scenario very few firms met the Pr 0.6,0.4 criterion, we use the Pr 0.5,0.5 for our trading strategy.

[25] In an attempt to test the robustness of our prediction model we repeated the analysis conducted thus far using data

4.2.4. Further robustness tests

In order to examine even further the robustness of our results we performed the following: i) we designed additional trading strategies based on both earnings and cash flows, and ii) we tested whether the excess returns are due to risk differences. A discussion on each of the above tests follows.

i) Additional trading strategies based on both earnings and cash flows.

In order to examine the robustness of our results, we designed two additional trading strategies which take into consideration the fact that negative (positive) changes in CFO are generally viewed as bad (good) news. First, we took long positions in firms with an earnings $Pr > 0.5$ and a CFO $Pr > 0.3$ and short positions in those firms with an earnings $Pr < 0.5$ and a CFO $Pr < 0.7$ (hereafter Pr 0.3,0.7 strategy). Second, we took long positions in firms with an earnings $Pr > 0.6$ and a CFO $Pr > 0.4$ and short positions in those firms with an earnings $Pr < 0.4$ and a CFO $Pr < 0.6$ (hereafter Pr 0.4,0.6 strategy). Panel B of Table 6 presents the results of the Pr 0.3,0.7 trading strategy for the five-year period 1991–95. These results corroborate the evidence presented in Panel A of Table 6, i.e., that excess returns can be earned. More specifically, the average excess returns are 8.81%, 18.68% and 16.73% for the 36-month holding periods 1991–93, 1992–94 and 1993–95, respectively. Therefore, our results indicate that a trading strategy based on both earnings and cash flows can generate excess returns. By comparing these results with the evidence presented in Panel A of Table 5, we observe that these excess returns exceed the excess returns derived from the earnings-based trading strategy alone. Therefore, depending on the cut-off point, additional excess returns could be earned by employing a combined earnings and cash flows-based trading strategy.

Finally, the results derived from our fourth trading strategy presented in Panel C of Table 6 corroborate the evidence provided thus far, i.e., that excess returns can be earned by employing this trading strategy. More specifically, the average excess returns are 8.74%, 20.93% and 17.49% for the 36-month holding periods 1991–93, 1992–94 and 1993–95, respectively. Therefore, our results indicate that a trading strategy based on both earnings and cash flows can generate excess returns. By comparing these results with the results presented in Panel B of Table 5, we observe that these excess returns do not exceed the excess returns derived from the earnings-based trading strategy alone. Therefore, by employing this trading strategy one may not gain excess returns beyond those earned from an earnings-based trading strategy.

In summary, the following conclusions can be drawn from our trading strategies over the period 1991–95. First, similar to evidence for the US positive excess returns can be earned from the earnings-based trading strategy. Second, positive excess returns may be earned from the cash flow-based trading strategy, but these excess returns are much lower than those derived from the earnings-based trading strategy. Third, positive excess returns can be earned from the combined earnings and cash flow-based trading strategies. Comparing the results of the combined earnings and cash flow-based trading strategy with the results of the earnings-based trading strategy, we find some evidence that the excess returns derived from the former method are superior.

ii) Risk-adjusted returns

In order to test whether excess returns are driven by the higher risk in the long portfolio, we regressed the monthly return for the hedge portfolio against the market return (Greig, 1992; Zarowin, 1989; DeBondt and Thaler, 1987).

$$R_{At} = a_A + b_A\ R_{mt}$$

where:

$R_A = R_L - R_S$. R_L and R_S are the returns to the long position ($Pr > 0.6$) and short position ($Pr < 0.4$) respectively for month t, and R_m is the return on the market portfolio. The b_A is the beta estimate for the hedge portfolio. According to Greig (1992), one of the major advantages of this approach is that beta and abnormal returns are estimated simultaneously, and therefore the problem of time variation in beta for stocks in the hedge portfolio is avoided.

Table 7 presents the regression results of the association of the market returns (R_m) with the monthly return for the hedge portfolio (R_A). We run regressions for three separate 12-month periods: months 1–12, 13–24 and 25–36, where month 0 is the month that the Pr is computed. In all three years tested, the difference in betas between the long and short positions is statistically insignificant, indicating that the long position is not significantly riskier than the short position for each of the three annual periods examined. More specifically, the difference in betas is 0.152 ($p = 0.103$), 0.0066 ($p = 0.911$) and 0.0161 ($p = 0.788$) for the first, second and third years, respectively. In summary, these results indicate that the excess returns found by using our trading

---

for the years 1988–91 and 1989–92. We form two additional portfolios, the first for 1992 (holding period is 1992(+4) to 1993(+3)) and the second for 1993 (holding period is 1993(+4) to 1994(+3)). The prediction results are qualitatively similar to those presented in this study.

Table 7

Regression results of hedge portfolios

$$R_A = a_A + b_A(R_m)$$

	a_A	b_A	R^2	N
Year 1	0.0106 (0.052)*	0.152 (0.103)	0.083	33
Year 2	0.0272 (0.000)***	0.0066 (0.911)	0.000	33
Year 3	0.0202 (0.000)***	0.0161 (0.788)	0.003	30

Results of regressions of monthly hedge portfolio returns R_{At} against the market return (R_{mt}) for each of the three years of the test period 1991–1995. The return of the hedge portfolio for month t, $R_{At} = R_L - R_r$, where R_L is the return for firms with $Pr > 0.6$ and R_S is the return for firms where $Pr < 0.4$.

t-statistics are in parentheses. N: number of observations used to estimate the regression coefficients. Coefficients are statistically significant from zero at a = 0.01(***), a = 0.05(**), and a = 0.10(*).

strategies are not due to risk differences across the long and short portfolios.

5. Conclusion

This study provides empirical evidence of the usefulness of future earnings and cash flow predictions in gaining excess returns for a sample of UK publicly-traded firms. Our results are consistent with the US evidence provided by Ou and Penman (1989) and Holthausen and Larcker (1992).[26] We conclude that: i) financial information predicts one-year ahead earnings and cash flow changes, and ii) trading strategies based on the summary value measure Pr extracted from the earnings model and from the combined earnings/cash flow models may earn excess returns. Our results are robust to alternative trading schemes, length of the holding period, earnings and cash flow combinations and risk controls. Overall, the findings of this study not only reinforce prior US evidence but also provide further insight i) on the usefulness of accounting variables in predicting earnings and cash flow changes, and ii) on the usefulness of future earnings in predicting stock returns. The findings of this study should be interpreted with caution i) because of the lack of a theoretical framework linking financial information to future earnings and cash flow changes and ii) due to the weaknesses of the statistical and empirical models. Future research should be directed towards building strong theoretical models linking financial information to the prediction of earnings, cash flows and stock returns by taking into consideration firm-specific and industry-specific characteristics, since predictor variables are expected to vary depending on certain firm characteristics. Moreover, since our results indicate that it is the accrual component of future earnings that the market has more trouble forecasting, future research may combine this methodology with the development of a model that forecasts the accrual component and take positions based on forecasted accruals.[27]

References

Accounting Standards Board (1991). 'Financial Reporting Standard No. 1'. *Cash Flow Statements* (September). London: UK.

Accounting Standards Board (1996). 'Financial Reporting Standard No. 1'. *Cash Flow Statements Revised*. London: UK

Ali, A. and Pope, P. (1995). 'The incremental information content of earnings, funds flows and cash flow: UK evidence'. *Journal of Business Finance and Accounting*, 22 (January): 19–34.

Abarbanell, J. and Bushee, B. (1997). 'Fundamental analysis, Future earnings, and stock prices'. *Journal of Accounting Research*, 35 (1) (Spring): 1–24

Arnold, A., Clubb, C., Manson, S., and Wearing, R. (1991). 'The relationship between earnings, funds flow and cash flow: evidence for the UK'. *Accounting and Business Research*, 22 (Winter): 13–19.

Bauman, M. (1996). 'A review of fundamental analysis research in accounting'. *Journal of Accounting Literature*, 15: 1–33.

Bernard, V. and Stober, T. (1989). The nature and amount of information in cash flows and accruals'. *The Accounting Review*, LXIV, No. 4 (October): 624–652.

Board, J. and Day, J. (1989). 'The information content of cash flow figures'. *Accounting and Business Research*, 20 (Winter): 3–11.

Bowen, R., Burgstahler, D. and Daley, L. (1986). 'Evidence on the relationship between earnings and various measures of cash flow'. *The Accounting Review* (October): 713–725.

---

[26] The present and prior studies did not take into consideration transaction costs. Alternatively, excess returns may be thought of as the rents of the labour resources analysts consume in implementing certain investment strategies. Sloan (1996) also points out that the information acquisition costs and processing costs associated with implementing these strategies in real time are not-trivial.

[27] We thank an anonymous reviewer for suggesting this possible extension of this research.

Bowen, R., Burgstahler, D. and Daley, L. (1987). 'The incremental information content of accruals versus earnings'. *The Accounting Review*, LXII (4) (October): 723–747.

Charitou, A. and Charalambous, C. (1996). 'The prediction of earnings using financial statement information: empirical evidence with logit models and artificial neural networks'. *International Journal of Intelligent Systems in Accounting, Finance and Management*, 5: 199–215.

Charitou, A. and Vafeas, N. (1998). 'The association between operating cash flows and dividend changes: an empirical investigation'. *Journal of Business Finance and Accounting*, 25 (1) & (2), (January/March): 225–249.

Cho, J. Y. and Jung, K. (1991). 'Earnings response coefficients: a synthesis of theory and empirical evidence'. *Journal of Accounting Literature*, 10: 85–116.

Clubb, C. (1995). 'An empirical study of the information content of accounting earnings, funds flows and cash flows in the UK'. *Journal of Business Finance and Accounting*, 22 (January): 35–52.

Clubb, C. (1996). 'Valuation and clean surplus accounting — some implications of the Feltham and Ohlson Model for the relative information content of earnings and cash flows'. *Contemporary Accounting Research* 13, (Spring): 329–37.

Dechow, P. (1994). 'Accounting earnings and cash flows as measures of firm performance: the role of accounting accruals'. *Journal of Accounting and Economics, (July): 3–42.*

De Bondt, W. and Thaler, R. (1987). 'Further evidence on investor overreaction and stock market seasonality'. *Journal of Finance*, 42: 557–581.

Fama, E. (1976). Foundations of Finance, New York: Basic Books.

Freeman, R., Ohlson, J. and Penman, S. (1982). 'Book rate of return and prediction of earnings changes: an empirical investigation'. *Journal of Accounting Research* (Autumn): 639–653.

Greig, A. (1992). 'Fundamental analysis and subsequent stock returns'. *Journal of Accounting and Economics:* 413–442.

Haskins, M., Ferris, K. and Selling, T. (1996). 'International financial reporting and analysis'. Irwin.

Healy, P. (1985). 'The Effect of Bonus Schemes on Accounting Decisions'. *Journal of Accounting and Economics* (April).

Holthausen, R. and Larcker, D. (1992). The prediction of stock returns using financial statement information'. *Journal of Accounting and Economics*, 15: 373–411.

Lawson, G. (1981). 'The cash flow performance of UK companies' in *Essays* in *British Accounting Research.*

Lee, T. (1981). 'Cash flow accounting and corporate financial performance' *in Essays in British Accounting Research.*

Lev, B. (1989). 'On the usefulness of earnings and earnings research: lessons from two decades of empirical research'. *Journal of Accounting Research* (Supplement): 153–189.

Lev, B. and Ohlson, J. (1982). 'Market-based empirical research in accounting: review, interpretation and extension'. *Journal of Accounting Research* (Supplement): 249–322.

Lev, B. and Thiagarajan, S. R. (1993). 'Fundamental information analysis'. *Journal of Accounting Research*, 31: 190–215.

Lipe, R. (1986). 'The information contained in the components of earnings'. *Journal of Accounting Research* (Supplement): 37–64.

Nobes, C. and Parker, R. (1995). 'Comparative International Accounting'. New Jersey: Prentice Hall (4th ed.).

Ou, J. (1990). 'The information content of non-earnings accounting numbers as earnings predictors'. *Journal of Accounting Research*, 28 (1) (Spring): 144–163.

Ou, J. and Penman, S. (1989). 'Financial statement analysis and the prediction of stock returns'. *Journal of Accounting and Economics*, 11: 295–329.

Sloan, R. (1996). 'Do stock prices fully reflect information in accruals and cash flows about future earnings?'. *The Accounting Review*, 71 (3): 289–315.

Strong, N. and Walker, M. (1993). 'The explanatory power of earnings for stock returns'. *The Accounting Review*, 68 (2): 385–99.

Watts, R. and Zimmerman, J. (1986). *Positive Accounting Theory*, New Jersey: Prentice Hall.

Wilson, G. P. (1986). 'The relative information content of accruals and cash flows: combined evidence at the earnings announcement and annual report release date'. *Journal of Accounting Research* (Supplement): 165–200.

Zarowin, P. (1989). 'Does the stock market overreact to corporate earnings information?' *Journal of Finance*, 44: 1,385–1,399.

Accounting and Business Research, Vol. 29. No. 4. pp. 299–319. 1999

Cross-sectional estimation of abnormal accruals using quarterly and annual data: effectiveness in detecting event-specific earnings management

Debra C. Jeter and Lakshmanan Shivakumar*

Abstract—This paper addresses certain methodological issues that arise in estimating abnormal (or discretionary) accruals for detection of event-specific earnings management. Unlike prior studies (e.g., Dechow, Sloan, and Sweeney, 1995; Guay, Kothari, and Watts, 1996) that rely primarily on time-series models, we focus on the specification of cross-sectional models of expected accruals using quarterly as well as annual data. Perhaps more importantly, we present a variation of the Jones model that is shown to be well specified for all cash flow levels. We show that the cross-sectional Jones model yields systematically positive (negative) estimates of abnormal accruals for firms whose cash flows are below (above) their industry median. Using mean squared prediction errors as well as simulation analysis, we show that our model is more powerful than the cross-sectional Jones model in detecting earnings management. In addition, we examine differences in the power of current accrual models in detecting earnings management across audited and unaudited quarters.

1. Introduction

Earnings management around firm-specific events has received considerable attention from researchers in recent years. Much of the research in this literature uses discretionary accruals (or, more accurately, abnormal accruals) to examine earnings management, where abnormal accruals are defined as actual accruals minus expected accruals. Given the importance of the expectations model in estimating abnormal accruals, it is essential to use the most precise models of expected accruals available in tests of earnings management. Several studies have addressed the adequacies and inadequacies of the extant models for estimating discretionary accruals, focusing typically on time-series estimation. We extend this literature in two ways. First, we introduce a new model that controls explicitly for the level of cash flows, and we examine its specification and power to detect abnormal accruals. Second, we assess the adequacy of the currently available accrual models, using cross-sectional estimation procedures and quarterly as well as annual data.

The focus of this paper is to improve the methodology for detecting event-specific earnings management (such as earnings management around seasoned equity offerings, IPOs, import relief investigations, etc.) and does not directly address studies where there is no firm-specific event (such as studies examining earnings management to increase managerial compensation or to smooth reported earnings). Studies of event-specific earnings management typically study the *mean* abnormal accruals across event firms and test whether the mean is significantly different from zero (see, e.g., Jones (1991), DeAngelo (1986, 1988), etc.). A mean that is significantly different from zero is interpreted as being consistent with earnings management related to the event under examination. In arriving at this conclusion, such studies implicitly assume that the mean abnormal accruals would have been zero in the absence of the firm-specific event. One of the objectives of this paper is to test the validity of this assumption.

Dechow, Sloan and Sweeney (1995) examine a few of the currently available, time-series based accrual models for misspecification and statistical power and argue that while the models examined are well specified for randomly chosen firms, they are misspecified for firms with extreme cash flows.

---

*The authors thank J. S. Butler, Arnold Cowan, Paul Chaney, Shameek Konar, Craig Lewis, Ronald Masulis, seminar participants at Vanderbilt University, and two anonymous reviewers for their comments. Financial support from Financial Markets Research Center at Vanderbilt University is gratefully acknowledged. The authors are, respectively, at Owen Graduate School of Management, Vanderbilt University, Nashville, TN 37203, jeterdc@trvax.vanderbilt.edu and the London Business School. Correspondence should be addressed to Mr Shivakumar, assistant professor of accounting, London Business School, Sussex Place, Regent's Park, London NW1 4SA. Email: LShivakumar@lbs.ac.uk

They also find these models to have low power in detecting earnings management. Guay, Kothari and Watts (1996) examine the same models as Dechow et al. (1995), also in a time-series context, and present evidence consistent with their argument that all the models estimate discretionary accruals with considerable imprecision.[1]

In this paper, we present a modification of the Jones model and test the specification of this model.[2] Whereas other earnings management models do not control for the strong negative relation between total accruals and cash flows, we introduce variables to control for changes in cash flows over time. This extension of the Jones model is shown to be well specified for all cash flow levels and to exhibit more power than the conventional Jones model in detecting earnings management.

Cross-sectional models have been generally well received in the literature and have been used in a number of papers (e.g., Defond and Jiambalvo, 1994; Chaney, Jeter and Lewis, 1998; Subramanyam, 1996). Since the parameter estimates from cross-sectional models are conceptually different from those obtained using time-series models, it is of interest to examine the specification and power of cross-sectional models. In the final section of the paper, we summarise the results of our estimation of the parameters of the time-series models as a contrast to the cross-sectional estimation presented throughout the paper.

Although most earnings management research is based on annual data, a few recent studies use quarterly data to detect earnings management (e.g., Shivakumar, 1997; Rangan, 1998). The use of quarterly data has several advantages in detecting earnings management around specific corporate events. Quarterly data provides a sharper focus on the event, which could increase the likelihood of detecting earnings management. Also, financial statements for interim quarters are often unaudited, allowing greater managerial discretion and requiring less detailed disclosure than annual financial statements. These differences provide managers with greater opportunities to manage earnings and, hence, make detection of earnings management more likely in interim quarters. Due to the advantages of using quarterly data, we evaluate the specification and the power of a variety of well-known models on this data. Accrual models that are well specified for annual data are not necessarily well specified for quarterly data for several reasons. For example, if managers defer bad news to the fourth quarter, a positive bias may result in abnormal accruals estimated in interim quarters with a compensating negative bias in the fourth quarter. Given the preponderance of earnings management studies based on annual data, we evaluate these models using annual data as well. In addition, we examine possible differences in the degree of earnings management in audited (fourth) quarter versus unaudited (interim) quarters using a random sample of firms.

Using simulation analyses similar to those performed by Brown and Warner (1985), we derive the following major conclusions. Our results are consistent with Dechow et al.'s (1995) findings for time-series models in several respects. We find evidence that the cross-sectional Jones model is well specified for random firms but misspecified for firms whose cash flows deviate systematically from the industry median. Extending the Jones model to explicitly control for cash from operations, as proposed by Shivakumar (1996), yields a model that is well specified for all cash flow levels. The abnormal accruals estimated from the cross-sectional models appear to be less imprecise than those estimated by Guay, Kothari and Watts (1996) using the time-series models. Finally, across a random sample of firms, there is greater evidence of noise and/or earnings management in the fourth quarter than in the interim quarters. In view of the complexities that arise in the fourth quarter related to settling up or 'house cleaning', and the difficulty inherent in separating noise from earnings management in the fourth quarter, we suggest that tests of earnings management may be less powerful in these quarters than in interim quarters.

The remainder of the paper is organised as follows. In Section 2, we discuss the various models examined here, while Section 3 discusses managers' incentives and opportunities to manage earnings in interim quarters versus the fourth quarter. In Section 4, we describe the methodology adopted to test the specification and the power of the various models. Section 5 presents the results, and Section 6 concludes.

2. Estimating discretionary accruals

Studies examining earnings management typically decompose total accruals into expected (or nondiscretionary) accruals and abnormal (or discretionary) accruals, a procedure that relies heavily on the descriptive accuracy of the expectations model used. Most of the models of expected accruals require the estimation of one or more parameters. The parameters of time-series models are estimated for each firm in the sample using data from periods prior to the event period. In contrast, the parameters of cross-sectional models are estimated each period for each firm in the event sample using contemporaneous accounting data of firms in the same industry.

---

[1] Although Guay, Kothari and Watts (1996) present evidence of imprecision in all the models examined, they state that 'among the extant models, only the Jones and modified Jones models appear to have the potential to provide reliable estimates of discretionary accruals'.

[2] Throughout the paper, we often refer to the cross-sectional adaptation of the Jones model simply as the Jones model.

The time-series models and the cross-sectional models provide conceptually different estimates of abnormal accruals due to differences in their approaches for estimating expected accruals. To estimate model parameters, time-series models use data from an estimation period during which no systematic earnings management is expected to occur. Cross-sectional models make no assumptions regarding systematic earnings management in the estimation sample, but implicitly assume that the model parameters are the same across all firms in an estimation sample. The abnormal accruals estimated from these models can be interpreted as 'industry-relative' abnormal accruals. To see this, consider an industry that is enjoying favourable economic conditions. If firms smooth reported earnings, then the 'actual' abnormal accruals for the firms in this industry will be negative. Cross-sectional models are unlikely to capture all the negative abnormal accruals, however, since the earnings management is contemporaneously correlated across firms in the sample. Thus only those firms whose accruals are negative relative to the industry benchmark will be identified as earnings managers. This introduces a potential limitation of the cross-sectional approach, or a bias against finding evidence of earnings management in some cases.[3]

Nonetheless, these 'industry-relative' abnormal accruals can be a useful tool for researchers examining event-specific earnings management. By controlling for industry-wide earnings management, cross-sectional models enable researchers to detect earnings management above and beyond the average unconditional earnings management found in that industry. It is this type of earnings management that is the focus of this study, and thus its primary relevance is for event studies. Certainly, time-series models can be modified to control for industry- or economy-wide earnings management as well. Though time-series models can be used to estimate a firm's 'actual' abnormal accruals, these models suffer from severe survivorship bias as well as selection bias. Typically, time-series models (such as the Jones model) require at least ten observations in the estimation period to obtain minimally reliable parameter estimates. For studies using annual data, this requirement implies that the sample firms must survive for at least 11 years. Since such firms are more likely to be large, mature firms with greater reputational capital to lose if earnings management is uncovered, this methodology introduces a selection bias. In contrast to time-series models, the cross-sectional approach has the practical advantage of generating larger samples, but it does not generate firm-specific coefficients.

We briefly discuss below the various models that are examined here. For each event quarter, the model parameters are estimated from a cross-sectional regression using contemporaneous accounting data of firms in the same two-digit SIC code.

2.1. Jones model

The Jones model attempts to estimate expected accruals after controlling for changes in a firm's economic environment. Expected accruals under the Jones model is measured by

$$E(acc_{it}/a_{it-1}) = \beta_1\ (1/a_{it-1}) + \beta_2\ (\Delta rev_{it}/a_{it-1}) + \beta_3\ (gppe_{it}/a_{it-1}) \qquad (1)$$

where Δrev_{it} is the change in revenues in period t from period t-1; $gppe_{it}$ is the gross property, plant and equipment at the end of period t; and a_{it-1} is the book value of total assets at the end of period t-1. β_1, β_2 and β_3 are firm-specific parameters that are estimated (using firms in the same two-digit SIC code) from the following OLS regression.

$$acc_{it}/a_{it-1} = b_1\ (1/a_{it-1}) + b_2\ (\Delta rev_{it}/a_{it-1}) + b_3\ (gppe_{it}/a_{it-1}) + \varepsilon_i \qquad (2)$$

where acc_{it} is the actual accruals of firm i in period t; and b_1, b_2 and b_3 are the OLS estimates of β_1, β_2 and β_3, respectively.

This model treats revenues as entirely non-discretionary. However, if earnings are managed by shifting revenues from future periods, the Δrev_{it} would be endogenous to the model. In order to control for this endogeniety bias, Dechow et al. (1995) propose a modification to the Jones model, in which the expected accruals are computed as:

$$E(acc_{it}/a_{it-1}) = \beta_1\ (1/a_{it-1}) + \beta_2\ (\Delta rev_{it} - \Delta rec_{it}/a_{it-1}) + \beta_3\ (gppe_{it}/a_{it-1}) \qquad (3)$$

where Δrec_{it} is defined as the change in receivables for firm i from period t-1 to period t. The estimates of β_1, β_2 and β_3 are those obtained from the original Jones model. The only modification relative to the Jones model is that the change in revenues is adjusted for the change in receivables for each sample firm. This modified version of the Jones model implicitly assumes that all changes in uncollected credit sales at the end of the event period result from earnings management. The reasoning behind this modification is that earnings are easier to manage via credit sales than cash collections.

---

[3] Import relief investigations, examined by Jones (1991), is an example of an event where earnings management is expected to occur contemporaneously across several firms in an industry.

Though the modified Jones model attempts to control for the endogeneity bias in the original Jones model, it potentially introduces a bias of its own. First, the assumption that *all* changes in uncollected credit sales result from earnings management is unlikely to be valid, resulting in over-correction. Secondly, this modification is only appropriate during periods when earnings are actually managed in this manner. However, in most event-specific studies of earnings management, the periods in which earnings are actually managed are not known to the researcher (e.g., the precise quarter within the event year), and uniformly applying this modification to all event quarters or event years could lead to further misspecification. For example, some firms might manage earnings in all four quarters of the event year, while others might manage earnings in only one or two. Finally, the reasoning underlying the modification suggests that changes in receivables should be in the same direction as the hypothesised management of earnings. This then raises the issue of whether or not a researcher should apply the same modification to firms for which the change in receivables is opposite in direction to that of the change in revenues.

2.2. *CFO model*

Prior studies (Dechow, 1994; Dechow, Sabino and Sloan, 1996) have documented a negative relation between cash flows and accruals even in the presumed absence of any systematic earnings management. Moreover, Dechow et al. (1995) show that the time-series Jones model is not well specified for firms with extreme cash flows. Since this misspecification may be due to the fact that the Jones model does not control for cash from operations, some recent studies have incorporated cash from operations as an extension of the Jones model. See, for example, Rees, Gill and Gore (1996), Hansen and Sarin (1996), and Shivakumar (1997).

We test the power and degree of misspecification of the extended Jones model that controls for cash from operations. In particular, we test the model developed by Shivakumar (1996) since this model is quite general. Shivakumar (1996) argues the existence of a non-linear relationship between cash from operations (cfo) and accruals in cross-sectional data.[4] To accommodate the possibility of such a relation between cash flows and accruals, the slope coefficient on cfo_{it}/a_{it-1} in the model is allowed to vary across firms as shown below.

$$
\begin{aligned}
E(acc_{it}/a_{it-1}) = \kappa_0+\kappa_1\ & \Delta rev_{it}/a_{it-1} + \kappa_2\, gppe_{it}/a_{it-1} + \\
& \kappa_3\, d1_{it}{*}cfo_{it}/a_{it-1} + \\
& \kappa_4 d2_{it}{*}cfo_{it}/a_{it-1} + \\
& \kappa_5\, d3_{it}{*}cfo_{it}/a_{it-1} + \\
& \kappa_6\, d4_{it}{*}cfo_{it}/a_{it-1} + \\
& \kappa_7\, d5_{it}{*}cfo_{it}/a_{it-1} \qquad (4)
\end{aligned}
$$

Cash flows are defined as earnings before extraordinary items less accruals (acc_{it}). We define (total) accruals and earnings as follows (with *COMPUSTAT* data item numbers indicated parenthetically first for annual items, then for quarterly): $acc_{it} = \Delta Receivables_{it}$ (2,37)+ $\Delta Inventory_{it}$(3,38)+ΔOther current $assets_{it}$ (68,39) − ΔAccounts $payable_{it}$ (70,46) − ΔIncome tax $payable_{it}$ (71,47) − ΔOther current $liabilities_{it}$ (72,48) − $Depreciation_{it}$ (14,5), where change (Δ) is computed between time t and time t-1; and earnings before extraordinary items (18,8).

Our calculation of cash from operations is dependent on our definition of total accruals, as stated above. Because we exclude some adjustments (such as gains/losses on sale of fixed assets) that are included in earnings before extraordinary items, the computed amount does not necessarily equal in every case the cash from operations reported in a firm's statement of cash flows. Nonetheless, we chose this specification because of its consistency with prior studies, and because our purpose is largely to examine the performance of the accruals models used in accounting research studies.

Firms in each estimation sample are sorted into quintiles based on cfo_{it}/a_{it-1}, and $d1_{it}$ to $d5_{it}$ are indicators for the cash flow quintile to which a firm belongs. The firm-specific parameters, κ_0 through κ_7, are estimated similarly to the estimation of parameters for the Jones model.

---

[4] Shivakumar (1996) argues that the non-linear specification for cash flows is desirable since cash from operations (cfo_{it}/a_{it-1}) may vary across firms in the estimation sample, due either to differences in the long-run level of return on assets (net income/a_{it-1}) or to matching and/or timing problems in cash flows. Further, the relative importance of these two sources of cash flow variation will differ across firms in the estimation sample. For example, since the estimation sample consists of firms in the same industry, extreme differences in cash flows among firms are more likely to result from matching or timing differences than from differences in return on assets. In contrast, firms with cash flows near their industry median are likely to be 'steady state' firms, as defined in Dechow (1994), with relatively less variability in cash flows arising from timing or matching issues. In the present paper we have chosen the non-linear specification because it is more general and does not constrain firms with extremely low cash flows to have the same slope coefficient as firms with moderate or high cash flows.

3. Abnormal accruals in interim quarters versus fourth quarter

In this paper, we examine the specification and the relative power of the accrual models across fiscal quarters in view of the possibility that differences across quarters may affect the ability of the models to detect event-specific earnings management. We examine the specification of alternative models in various quarters in part because of the bad news deferral argument presented by Mendenhall and Nichols (1988). They argue that managers have an income increasing bias in the interim quarters and defer bad news to the fourth quarter. This argument suggests that the average discretionary accruals could be positive in interim quarters and negative in the fourth quarter. This interpretation of Mendenhall and Nichols' argument implies that tests for the null hypothesis of no earnings management may be rejected in all quarters.

Apart from specification issues, the power of accruals models in detecting event-specific earnings management may also vary across quarters depending on managerial incentives and/or opportunities for earnings management in the quarters. Specifically, the quarters in which managers have greater incentives (unrelated to the event of interest) or greater opportunities for earnings management will include more noise in the abnormal accrual estimates, lowering the ability of the model to detect earnings management. Incentives and opportunities for earnings management are likely to vary across interim and final quarters for at least three distinct, but not mutually exclusive, reasons.

First, the absence of an independent audit in interim quarters provides managers with greater opportunities to manipulate earnings. Second, managers may be less concerned about manipulating the numbers for interim reports, as compensation plans and debt covenants are generally focused on year-end reports. Finally, we acknowledge the possibility that managers, on average, report their good-faith best estimates in the interim periods and correct those estimates, as needed, in the fourth period. We elaborate upon each of these issues next.

Financial statements for interim quarters may be argued to allow for greater use of discretion on the part of managers than the financial statements for the fourth quarter or the annual statements. Whether this discretion improves or detracts from the quality of the reported earnings numbers is not entirely a resolved issue. Sankar and Subramanyam (1997) discuss the relative advantages of allowing discretion and of restricting (or constraining) the extent of discretion allowed. Under Generally Accepted Accounting Principles (GAAP), firms may use estimates for certain costs and expenses (such as damages and losses in inventory, income tax expenses, LIFO liquidation) in interim quarters. The actual amount of these expenses need not be determined until the fiscal year end, at which time any difference between the estimates and the actual for the previous quarters is adjusted. The use of estimates for expenses in the interim quarters provides managers with greater opportunities to manage reported earnings without violating GAAP.[5] Further, for timely reporting of financial information, quarterly reports are often unaudited and require much less disclosure than annual reports.[6]

The actual degree of discretion exercised by managers in interim quarters depends not only on their opportunities but also upon their incentives for managing earnings. These incentives, in turn, may lead to differences in the performance of alternative models across quarters. We restrict the following discussion of incentives for earnings management to those that we deem as most likely to be common to managers from a random sample of firms, since our empirical analyses are based on randomly selected firms. First, managers may manage earnings to avoid violating debt covenants (DeFond and Jiambalvo, 1994). Second, they may manage earnings to report a smooth or gradually increasing pattern of reported earnings (Chaney and Lewis, 1995; Subramanyam, 1996; Chaney, Jeter and Lewis, 1998). Third, managers may manage earnings to maximise their bonus compensations (Healy, 1985; Holthausen, Larcker and Sloan, 1995; Gaver, Gaver and Austin, 1995). While managers' incentives to avoid debt covenant violations and to smooth reported earnings may impact on financial statements in all quarters, their incentives are heightened in the fourth quarter. Often it is not until this quarter that managers are aware of their exact (or even, in some cases, approximate) position with regard to bonus plans or income smoothing targets. Hence, if bonus compensation and/or achieving a specified target level of earnings are important incentives for earnings management, we would expect managers to exercise greater discretion in the fourth quarter than in the interim quarters.

---

[5] A significant body of research has demonstrated that the market reacts to interim earnings announcements, despite the fact that only the annual report is audited. In fact, Kross and Schroeder (1990) present evidence that the reaction, as evidenced in the earnings response coefficient, is larger on average for the interim reports than for the year-end announcement, among relatively small firms. They attribute this difference to the requirement that errors in previous quarters' earnings be reversed in the quarter of discovery.

[6] See Mendenhall and Nichols (1988) for a more detailed comparison of the accounting discretion available to managers in interim quarters and the discretion available in the fourth quarter.

The prevalence of the fourth quarter as the time to adjust or correct interim period estimates (or misestimates), as well as any incentives for managers to achieve target levels of annual earnings, suggest that we should find greater variation in our estimates of abnormal accruals in the fourth quarter. However, the opportunity to exercise discretion is likely to be greater in unaudited quarters, in which case we might expect the opposite; i.e., more variation in the abnormal accrual estimates in interim quarters.

4. Methodology and sample construction

4.1. Test of specification of models

In order for a regression-based expectations model to be effective in estimating discretionary accruals and thus in testing for earnings management, it is essential that the model be well specified in the context in which it is used. We test the specification of the various models by examining the mean abnormal accruals for randomly selected samples of firm-periods.[7] Due to the random selection of firm-periods, no systematic earnings management is expected in our samples. Hence, if the models are well specified, we should not reject the null hypothesis of a mean of zero for these samples.

Recall that the focus of this paper is to test the specification of models used in detecting event-specific earnings management rather than the type of management that may occur in the absence of a firm-specific event (such as managers' incentives to maximise compensation or to smooth reported earnings). The methodology adopted in our study can be justified even if individual firms manipulate earnings in other ways, such as smoothing, since our focus is on means rather than on individual firms. Since no systematic earnings management is expected in our random samples, we expect the mean abnormal accruals across the firms to be insignificantly different from zero. Some firms in the random sample may overstate earnings while others may be understating earnings. The presumption in event-specific studies of earnings management is that these overstatements and understatements should cancel out in a random sample.

Our specification tests are based on a simulation method similar to the one used by Brown and Warner (1985). This method is implemented by forming 200 samples of 100 randomly selected firms from the universe of firms available on COMPUSTAT. The firms in each sample are chosen without replacement to ensure that the observations within a sample are independent. Each firm is then assigned a randomly chosen period as the event period, and the abnormal accruals are estimated for this event period using alternative accrual models. The average abnormal accruals across firms are then computed for each sample, and these averages are evaluated across the samples to identify significant deviations in the frequency of type I errors from conventional test levels.

Since Dechow et al. (1995) find the time-series Jones model to be misspecified for firms with extreme cash flows, we also examine the specification of the expected accrual models after controlling for the cash flow levels of the firms. We implement this by selecting 1,000 firm-periods in each cash flow quintile and testing whether the average discretionary accruals across firms in each quintile are significantly different from zero. The quintiles are formed for each period and for each industry by sorting the firms in that industry based on their cash from operations. The indicator variables $d1_{it}$, $d2_{it}$, $d3_{it}$, $d4_{it}$ and $d5_{it}$ designate the quintile from the CFO model. We select 1,000 firm-periods for which $d1_{it}=1$, 1,000 firm-periods for which $d2_{it}=1$, etc. The mean abnormal accruals for the 1,000 firm-periods in each quintile are then tested for significant differences from zero using t-tests. The t-test in analysis of means can be justified since the means are asymptotically normally distributed according to the Central Limit Theorem. To control for possible heteroskedasticity in cross-sectional means, we use the White's (1980) standard errors to compute the t-statistics.

4.2. Tests of models' power in detecting earnings management

We examine the power of the various models in detecting earnings management using the Brown and Warner simulation model. We test the power of the competing models by artificially introducing earnings management of a fixed and known amount in the firm-periods selected. We then examine the mean abnormal accruals and evaluate the frequency with which the alternative models reject the null hypothesis of no earnings management.

As noted by Dechow et al. (1995), the ability of the models to detect earnings management depends on the components of accruals that are managed. We follow a similar approach to that of Dechow et al. and make two different sets of assumptions regarding the components of accruals that are manipulated.

(1) Expense manipulation: this type of manipulation assumes that accruals are manipulated by delaying the recognition of expenses. This approach to accrual manipulation is implemented

---

[7] We use the term 'firm-period' to refer to a particular accounting period (either a quarter or a year) for a particular firm.

by adding an assumed amount of manipulation to total accruals in the event period. Since none of the models considered in this paper uses expenses to estimate expected accruals, we do not adjust any of the other variables in this analysis.

(2) Revenue manipulation: under this type of manipulation, accrual manipulation is assumed to occur through premature recognition of revenues. This approach is implemented by adding the assumed amount of sales manipulation to both total accruals and Δrev_{it} in all the models.

The above types of manipulation provide us with the bounds on the ability of the models to detect earnings management. As discussed earlier, the models examined in this study suffer from endogeniety bias when earnings are manipulated through revenues. Moreover, as shown by Dechow et al. (1995), this bias would reduce the ability of the models to detect earnings management. By assuming that all manipulations occur through revenue, the revenue manipulation provides a lower bound on the ability of these models to detect earnings management. On the other hand, expense manipulation assumes that no manipulation occurs through revenue, thereby completely avoiding the endogeniety bias. Hence, this type of manipulation provides the upper bound to the ability of the models to detect earnings management. In reality, both types of manipulation are likely to be important sources of accrual manipulation and, hence, the actual ability of the models to detect earnings management would lie between these bounds.

4.3. Tests of specification and power of models across quarters

To demonstrate possible differences in the ability of the models to detect earnings management across various quarters, we analyse the abnormal accruals in each of the quarterly financial statements for 1,000 randomly selected firm-years. Observations are included in the sample for a given firm-year only if we have data available to estimate abnormal accruals in each of the quarters for that year. We initially examine the estimates of abnormal accruals in each quarter for the selected observations. This is intended to test the specification of the models in the various quarters and to examine the bad news deferral argument of Mendenhall and Nichols (1988). To investigate the amount of management and/or noise in the various quarters, we use the squared abnormal accruals. If managers have and exercise the same degree of discretion in all the quarters *and* if the level of noise is approximately the same in all quarters, then the squared abnormal accruals are expected to be the same across the quarters. On the other hand, if managers manage earnings more in certain quarters than in others, or if some quarters include more noise than others, then we expect larger squared abnormal accruals for such quarters.

Another way of viewing the effects of management and/or noise on the squared abnormal accruals is to consider the squared abnormal accruals, which are nothing more than squared prediction errors, as measuring the power of the models in detecting event-specific earnings management. Quarters in which we find squared abnormal accruals to be relatively high are quarters in which managers exercise greater discretion even in the absence of event-specific earnings management. For these quarters, the estimates of abnormal accruals in studies of event-specific earnings management would be particularly noisy, reducing the power of the tests for earnings management.

5. Results

This study examines earnings management using both annual and quarterly data that are obtained from 1994 COMPUSTAT. The firm-periods for which we estimate abnormal accruals are selected from 390,880 firm-quarters between 1984 and 1994 for analyses using quarterly data and from 171,478 firm-years between 1975 and 1994 for analyses using annual data.

We require at least 20 observations in the cross-sectional sample for estimating the parameters of cross-sectional models. We exclude highly influential observations by deleting observations which have absolute values of DFFITS greater than two.[8] This exclusion criterion is intended to provide us with parameter estimates that are representative of the sample.

The use of a constant definition for accruals across all firms introduces certain large and unusual observations, such as acquisitions, asset write-offs included in operating income, etc., which might invalidate our estimate of accruals.[9] Thus it is crucial to control for highly influential or anomalous observations. Such observations could impact on both our estimates of the parameters of the various models and the estimated abnormal accruals. To control for their influence, we exclude any observation for which the magnitude of our estimate of abnormal accruals is greater than 200% of the total assets for the firm. Excluding abnormal accruals in excess of 200% of total assets seems conservative, as it is unlikely that a manager would be able to manipulate earnings to such an extent without being detected. Hence we feel fairly

---

[8] See Belsley, Kuh and Welsch (1980) for a discussion of DFFITS.

[9] For example, transactions like asset write-offs that are included in operating income provide accrual estimates that impact on net income. But these transactions make the accruals non-comparable across firms, since some firms treat the asset write-offs as extraordinary income rather than operating income (and thus exclude them from our accruals measure).

Table 1
Descriptive statistics on total accruals

Total accruals

Mean	Std. Dev.	Min.	Quartile 1	Median	Quartile 3	Max.
−0.01*	−0.13	−0.425	−0.07	−0.03	0.02	1.51

*t-statistic = 3.01

Proportion >0	0.32
Sign tests (p-value)	<0.01
Skewness	3.72
Kurtosis	31.86
S-W statistic (p-value)**	<0.01

**S-W statistic is the Shapiro-Wilk statistic for test of normality.

The sample for this table consists of 1,000 firm-years randomly chosen from the universe of firm-years in the COMPUSTAT database. Total accruals are measured as $\Delta\text{Receivables}_{it}+\Delta\text{Inventory}_{it}+\Delta\text{Other current assets}_{it}-\Delta\text{Accounts payable}_{it}-\Delta\text{Income tax payable}_{it}-\Delta\text{Other current liabilities}_{it}-\text{Depreciation}_{it}$, where change (Δ) is computed between time t and time t-1.

certain that such observations are anomalous.[10] Further, the results are qualitatively similar when the exclusion criterion is set at 100% of total assets rather than 200% as the cut-off.

5.1. Sample statistics for accruals

Since all our analyses are based on total accruals, we initially examine the distribution of total accruals for 1,000 randomly selected firm-years. Table 1 presents the descriptive statistics for total accruals. The mean and median accruals are negative, which is not surprising since a major component of total accruals is depreciation expense, a negative number. Also, the mean accruals are higher than the median accruals. Further, the kurtosis of the accruals for this set of firm-years is 31.86, indicating that the distribution has thick tails relative to a normal distribution. Finally, Table 1 presents the Shapiro-Wilk test statistic for normality. Using this statistic, we are able to reject the null hypothesis that all the accruals come from a normal distribution with the same mean and variance.

5.2. Cross-sectional models

Tables 2 and 3 present the results of the specification for abnormal accruals estimated using cross-sectional models and annual data. Table 2 presents the descriptive statistics for the parameter estimates and abnormal accruals for 1,000 randomly selected firm-years, while Table 3 analyses the frequency of type I errors in two hundred randomly selected samples.

From Panel A of Table 2, we observe that the mean and the median intercept terms are insignificant for the Jones model. Also, the coefficient for the change in revenues is positive in 93% of the regressions and is statistically significant for the average regression. Also, as expected, the coefficient for gross property, plant and equipment is significantly negative. Moreover, this coefficient is negative in 93% of the regressions. The average regression yields an adjusted R-square of 39% and uses 91 observations in the estimation sample.

Panel B of Table 2 presents the parameter estimates for the CFO model. The intercept term and the $gppe_{it}$ for this model are insignificantly different from zero. Thus, the addition of a cash flow measure to the Jones model apparently renders the $gppe_{it}$ term insignificant, suggesting one of the following two interpretations. Either the variable $gppe_{it}$ is proxying for cash flows, rather than for depreciation expense as previously believed, or a cash flow variable controls for the depreciation accrual *better* than the variable $gppe_{it}$. Further, as in the Jones model, the mean coefficient for change in revenues is significantly positive. The mean and the median coefficients on the cash flow variables are all negative as expected. Moreover, the coefficients for the cash flow variables in the extreme quintiles tend to be negative more often and are also more significant than the coefficients for cash flows in other quintiles. This is consistent with an expectation that the timing and matching problems are more severe for firms with extreme cash flows than for firms with cash flows closer to their industry median. Finally, in contrast to the Jones

---

[10] For any particular analysis, the number of observations with abnormal accruals greater than 200% of total assets is less than 1% of the observations used in that analysis. The mean (median) magnitude of the abnormal accruals that are excluded in the results reported in this study vary from 288% (277%) to 3271% (488%) of total assets depending on the analysis.

Table 2
Descriptive statistics for parameter estimates and abnormal accruals based on annual data

Panel A: Estimates for the Jones model

$E(acc_{it}/a_{it-1}) = \beta_1\ (1/a_{it-1}) + \beta_2\ (\Delta rev_{it-1}) + \beta_3\ (gppe_{it}/a_{it-1})$

	Mean	*Std. dev.*	*Quartile 3*	*Median*	*Quartile 1*	*Proportion >0*
Intercept	−0.07	0.57	0.05	−0.03	−0.13	0.43
(t-statistic)	(−0.39)	(2.94)	(0.97)	(−0.54)	(−1.69)	
ΔRev	0.17	0.13	0.23	0.16	0.09	0.93
(t-statistic)	(3.84)	(3.32)	(5.24)	(3.46)	(1.74)	
gppe	−0.06	0.05	−0.03	−0.06	−0.08	0.07
(t-statistic)	(−4.50)	(4.28)	(−1.88)	(−3.58)	(−5.81)	
No. of obs. in estimation sample	91	63	152	64	36	
R-squared	0.43	0.19	0.56	0.43	0.30	
Adj. R-squared	0.39	0.20	0.52	0.39	0.24	

ΔRev_{it} is the change in revenues in period t from period t-1
$gppe_{it}$ is the gross property, plant and equipment at the end of period t

Panel B: Estimates for the CFO model

$$E(acc_{it}/a_{it-1}) = \kappa_0 + \kappa_1\ \Delta rev_{it}/a_{it-1} + \kappa_2\ gppe_{it}/a_{it-1} + \kappa_3\, d1_{it}{*}cfo_{it}/a_{it-1} + \kappa_4 d2_{it}{*}cfo_{it}/a_{it-1}$$
$$+ \kappa_5 d3_{it}{*}cfo_{it} + /a_{it-1} \kappa_6 d4_{it}{*}cfo_{it}/a_{it-1} + \kappa_7 d5_{it}{*}cfo_{it}/a_{it-1}$$

	Mean	*Std. dev.*	*Quartile 3*	*Median*	*Quartile 1*	*Proportion >0*
Intercept	−0.15	0.81	0.00	−0.07	−0.19	0.24
(t-statistic)	(−1.34)	(2.57)	(−0.02)	(−1.34)	(−2.48)	
Δ Rev	0.15	0.11	0.21	0.15	0.09	0.95
(t-statistic)	(4.88)	(3.41)	(6.44)	(4.67)	(2.78)	
gppe	−0.01	0.05	0.01	−0.01	−0.04	0.35
(t-statistic)	(−0.62)	(2.21)	(0.60)	(−0.70)	(−1.80)	
d1*cfo	−0.49	0.23	−0.36	−0.49	−0.62	0.02
(t-statistic)	(5.14)	(3.25)	(−3.28)	(−4.63)	(−6.51)	
d2*cfo	−0.47	0.41	−0.30	−0.46	−0.62	0.06
(t-statistic)	(−3.10)	(2.39)	(−1.72)	(−2.80)	(−4.15)	
d3*cfo	−0.49	0.76	−0.21	−0.48	−0.73	0.14
(t-statistic)	(−1.99)	(2.25)	(−0.70)	(−1.68)	(−3.00)	
d4*cfo	−0.47	1.00	−0.09	−0.43	−0.80	0.19
(t-statistic)	(−1.71)	(2.70)	(−0.23)	(−1.35)	(−2.56)	
d5*cfo	−0.44	0.59	−0.08	−0.32	−0.78	0.15
(t-statistic)	(−3.90)	(7.47)	(−0.82)	(−2.42)	(−4.54)	
No of obs. in estimation sample	89	63	151	63	35	
R-squared	0.73	0.16	0.86	0.75	0.61	
Adj. R-squared	0.68	0.17	0.82	0.70	0.55	

ΔRev_{it} is the change in revenues in period t from period t-1
$gppe_{it}$ is the gross property, plant and equipment at the end of period t
cfo_{it} is the cash from operations for period t.

Firms in each estimation samples are sorted into quintiles based on cfo_{it}/a_{it-1} and $d1_{it}$ to $d5_{it}$ are indicators for the cash flow quintile to which a firm belongs.

Table 2 (contd)

Panel C: Abnormal accruals estimated using the Jones and the CFO models

Statistic	*Jones model*	*CFO model*
Mean abnormal accruals	0.002	−0.002
Variance	0.02	0.02
t-statistic	0.48	−0.36
Quartile 3	0.042	0.041
Median	−0.005	0.004
Quartile 1	−0.051	−0.033
Maximum	1.11	1.46
Minimum	−1.04	−1.66
Proportion >0	0.46	0.53
sign test (p-value)	0.05	0.05

The sample for this Table consists of 1,000 randomly chosen firm-years. Abnormal accruals are computed as the actual accruals less expected accruals ($E(acc_{it}/a_{it-1})$) estimated either from the Jones model or the CFO. model.

Table 3
Rejection frequencies based on one-tailed t-statistics for the null hypothesis of no earnings management using annual data

Null hypothesis:	*Earnings management ≤0*		*Earnings management ≥0*	
Test level:	*5%*	*1%*	*5%*	*1%*
Jones model	8.0%	1.0%	4.5%	0.5%
CFO model	4.0%	1.5%	5.5%	0.5%

The abnormal accruals for this table are estimated using first the Jones model and then the CFO model. The results are based on 200 samples with 100 randomly chosen firm-years in each sample.

Note: none of the values presented in this table are significantly different from the specified test level at the 5% level using a two-tailed binomial test.

model, the average adjusted R-square for this model is 68%. This suggests that the CFO model is able to explain a significant portion of the cross-sectional variation in accruals.

Panel C of Table 2 presents descriptive statistics for the abnormal accruals estimated for the 1,000 firm-years. The mean abnormal accruals for the Jones model and for the CFO model are not significantly different from zero, consistent with a claim that both the models are well specified. This conclusion is further supported by the results from analysing the frequency of type I errors in 200 randomly selected samples with 100 firm-periods in each sample (a variation of the methodology used by Brown and Warner). The results from this analysis, which are presented in Table 3, indicate that the null hypothesis of no earnings management is not rejected more often than expected using either of the cross-sectional models.

Tables 4 and 5 present the results corresponding to Tables 2 and 3 using quarterly rather than annual data. The parameter estimates for both the Jones and the CFO models are comparable to those obtained using annual data. However, the adjusted R-square for the Jones model is only 14% for quarterly data compared to 39% for annual data. In contrast, the adjusted R-square for the CFO model drops only slightly, to 66% for quarterly data from 68% for annual data. These statistics indicate that the CFO model not only explains a greater part of the cross-sectional variation in accruals than the Jones model but is also more stable across the type of data used in the analysis.

Panel C of Table 4 provides the descriptive statistics for the estimated abnormal accruals. The mean abnormal accruals are insignificantly different from zero for both the models, suggesting that the models are well specified. Also, interestingly, the sign test for the median indicates that the median of abnormal accruals from the CFO model is significantly positive. This finding, along with the result that the mean of abnormal accruals is insignificantly different from zero, suggests that when discretionary accruals are negative (income de-

Table 4
Descriptive statistics for parameter estimates and abnormal accruals based on quarterly data

Panel A: Estimates for the Jones model

	Mean	*Std. dev.*	*Quartile 3*	*Median*	*Quartile 1*	*Proportion >0*
Intercept	−0.02	0.46	0.02	−0.02	−0.06	0.38
(t-statistic)	(−0.72)	(2.50)	(0.57)	(−0.62)	(−1.83)	
ΔRev	0.16	0.26	0.29	0.19	0.03	0.80
(t-statistic)	(1.65)	(2.11)	(2.92)	(1.76)	(0.37)	
gppe	−0.02	0.02	−0.01	−0.02	−0.03	0.12
(t-statistic)	(−2.35)	(2.12)	(−0.86)	(−2.22)	(−3.53)	
No. of obs. in estimation sample	131	80	207	154	49	
R-squared	0.19	0.14	0.25	0.16	0.09	
Adj. R-squared	0.14	0.14	0.21	0.12	0.05	

ΔRev_{it} is the change in revenues in period t from period t-1
$gppe_{it}$ is the gross property, plant and equipment at the end of period t

Panel B: Estimates for the CFO model

	Mean	*Std. dev.*	*Quartile 3*	*Median*	*Quartile 1*	*Proportion >0*
Intercept	−0.06	0.21	−0.01	−0.05	−0.10	0.17
(t-statistic)	(−1.90)	(2.53)	(−0.49)	(−1.93)	(−2.89)	
ΔRev	0.17	0.15	0.25	0.16	0.08	0.94
(t-statistic)	(2.96)	(2.06)	(4.28)	(2.88)	(1.64)	
gppe	0.00	0.02	0.01	0.00	−0.01	0.49
(t-statistic)	(0.17)	(1.92)	(1.36)	(−0.02)	(−1.12)	
d1*cfo	−0.78	0.19	−0.68	−0.78	−0.89	0.00
(t-statistic)	(−10.01)	(7.42)	(−6.01)	(−8.48)	(−11.92)	
d2*cfo	−0.67	0.34	−0.49	−0.69	−0.84	0.02
(t-statistic)	(−4.14)	(3.03)	(−2.16)	(−3.55)	(−5.21)	
d3*cfo	−0.64	0.73	−0.29	−0.66	−0.96	0.13
(t-statistic)	(−2.13)	(2.49)	(−0.56)	(−1.69)	(−3.01)	
d4*cfo	−0.68	0.78	−0.34	−0.76	−1.10	0.12
(t-statistic)	(−2.52)	(3.06)	(−0.79)	(−2.15)	(−3.59)	
d5*cfo	−0.56	0.45	−0.27	−0.54	−0.87	0.05
(t-statistic)	(−7.38)	(14.95)	(−1.90)	(−4.31)	(−7.56)	
No. of obs. in estimation sample	129	81	205	154	47	
R-squared	0.69	0.20	0.87	0.70	0.54	
Adj. R-squared	0.66	0.21	0.85	0.66	0.50	

ΔRev_{it} is the change in revenues in period t from period t-1
$gppe_{it}$ is the gross property, plant and equipment at the end of period t
cfo_{it} is the cash from operations for period t.

Firms in each estimation sample are sorted into quintiles based on cfo_{it}/a_{it-1} and $d1_{it}$ to $d5_{it}$ are indicators for the cash flow quintile to which a firm belongs.

creasing), they tend to be relatively large. This is consistent with a 'big-bath' hypothesis that managers may combine large or numerous negative 'hits' of information into one period in the hope of benefiting future periods.

Table 5 presents the results of the incidence of type I errors for the quarterly sample. The results show that both the cross-sectional models are well specified for quarterly data. The rejection frequency for the null hypothesis of no earnings management is close to the specified test levels for both models.

In summary, the results in this section indicate that the Jones and the CFO models are well speci-

Table 4 (contd)

Statistic	*Jones model*	*CFO model*
Mean abnormal accruals	0.000	−0.002
Variance	0.01	0.01
t-statistic	0.10	−0.65
Quartile 3	0.025	0.018
Median	0.000	0.002
Quartile 1	−0.030	−0.014
Maximum	1.20	0.76
Minimum	−1.19	−1.28
Proportion >0	0.50	0.53
sign test (p-value)	0.92	0.02

The sample for this table consists of 1,000 randomly chosen firm-quarters. The variables and the accrual models are defined as in Table 2.
The rows corresponding to 't-statistic' report the summary statistics for t-statistics associated with the parameters in the row above it.

Table 5
Rejection frequencies based on one-tailed t-statistics for the null hypothesis of no earnings management using annual data

Null hypothesis:	*Earnings management ≤0*		*Earnings management ≥0*	
Test level:	*5%*	*1%*	*5%*	*1%*
Jones model	5.5%	1.5%	4.5%	0.5%
CFO model	5.5%	0.5%	5.5%	0.5%

The abnormal accruals for this table are estimated either using the Jones model or the CFO model. The results are based on 200 samples with 100 randomly chosen firm-years in each sample.

Note: None of the values presented in this table are significantly diferent from the specified test level at the 5% level using a two-tailed binomial test.

fied for randomly chosen firms for both annual and quarterly data. In the next section, we examine the specification of the models for firms with extreme performance as measured by their cash flows, focusing on the analysis of cross-sectional models using quarterly data.

5.3. Firm performance and abnormal accruals

Our initial analysis of the relation between the estimates of abnormal accruals and firm performance is based on 1,000 randomly selected firm-quarters in each cash flow quintile.

Table 6 presents the descriptive abnormal accruals for firm-quarters in each of the cash flow quintiles. Firm-quarters in cash flow quintile 1 are firm-quarters that are in the highest cash flow quintile of the firm's industry, while those in quintile 5 are the firm-quarters that are in the lowest quintile. Panel A presents the results for the abnormal accruals estimated using the Jones model. From this panel, we observe a monotonic relation between the cash flow quintiles and the estimated abnormal accruals. Firms in quintiles 1 and 2 have significantly negative abnormal accruals. Further, the mean abnormal accruals for quintile 3 is insignificantly different from zero, while the mean abnormal accruals for quintiles 4 and 5 are significantly positive. Moreover, only 9% of the firm-quarters in quintile 1 have positive abnormal accruals. This proportion increases monotonically across the quintiles and reaches a maximum of 77% for quintile 5. These results indicate that abnormal accruals estimated using the Jones model are highly sensitive to the cash flow level of the firm.

Panel B of Table 6 presents the descriptive statistics for the discretionary accruals estimated using the CFO model. The results from this panel indicate that the mean discretionary accruals are not significantly different from zero for any of the cash flow quintiles. Further, there is no evidence of a monotonic relation between the cash flow level and the proportion of firms with positive discretionary accruals. The proportion of firms with positive discretionary accruals is fairly constant across the cash flow quintiles. These findings in-

Table 6
Summary statistics of abnormal accruals for firm-quarters classified by cash flow quintiles

Panel A: Jones model

				Abnormal accruals					
		Mean	*Std. dev.*	*t-statistic*	*Proportion >0*	*Sign test (p-value)*	*Quartile 3*	*Median*	*Quartile 1*
Highest CFO	Quintile 1	−0.071	0.12	−18.61	0.09	<0.01	−0.020	−0.043	−0.085
	Quintile 2	−0.013	0.04	−10.55	0.33	<0.01	0.004	−0.007	−0.026
	Quintile 3	0.000	0.05	−0.48	0.57	<0.01	0.018	0.003	−0.011
	Quintile 4	0.016	0.06	9.05	0.74	<0.01	0.038	0.017	0.000
Lowest CFO	Quintile 5	0.060	0.16	11.97	0.77	<0.01	0.100	0.046	0.002

Panel B: CFO model

				Abnormal accruals					
		Mean	*Std. dev.*	*t-statistic*	*Proportion >0*	*Sign test (p-value)*	*Quartile 3*	*Median*	*Quartile 1*
Highest CFO	Quintile 1	−0.004	0.09	−1.24	0.51	0.22	0.020	0.001	−0.016
	Quintile 2	0.000	0.04	0.32	0.55	<0.01	0.015	0.002	−0.010
	Quintile 3	0.000	0.04	0.64	0.56	<0.01	0.015	0.003	−0.010
	Quintile 4	0.000	0.04	0.25	0.57	<0.01	0.019	0.004	−0.012
Lowest CFO	Quintile 5	−0.003	0.13	−0.75	0.55	<0.01	0.043	0.004	−0.041

Firms in each industry are sorted into quintiles based on their cash from operations.
Quintile 1 = firms with the highest cash from operations (CFO), quintile 2 the next highest, etc.
A random sample of 1,000 firm-quarters is then chosen across industries and cash flow quintiles for this analysis.

dicate that the CFO model is well specified for all cash flow levels.[11]

Table 7 presents the relation between abnormal accruals and cash from operations using regression analysis. This table provides the regression results from regressing abnormal accruals on cash from operations for 1,000 randomly selected firm-quarters. The results are presented without excluding any influential observations in the regressions and again after excluding observations with absolute values of DFFITS greater than two. The results under the two methods are qualitatively similar. Consistent with the results reported in Table 6, we find that the abnormal accruals from the Jones model have a significantly negative relation with cash flows. However, no such relation is obtained for abnormal accruals estimated using the CFO model.

Finally, we examine the abnormal accruals for the firms selected using the Brown and Warner methodology. This analysis involves randomly selecting 20,000 firm-quarters (200 samples of 100 firm-quarters each). We sort the 20,000 firm-quarters into 200 groups based on their cash from operations and estimate the mean abnormal accruals for each group. Figure 1 plots the mean abnormal accruals from the Jones model against mean cash from operations for these 200 groups, while Figure 2 plots the mean abnormal accruals from the CFO model against the mean cash from operations. Figure 1 clearly indicates a monotonic relation between abnormal accruals and cash from operations. Further, as seen in Figure 2, the mean abnormal accruals estimated from the CFO model is close to zero for all cash flow levels.

The above results suggest that the estimates of abnormal accruals from the Jones model are highly sensitive to cash flow levels. Whether the actual reason for the negative relation between cash flows and abnormal accruals in the Jones model is earnings management to smooth earnings or merely accruals mitigating the timing and matching problems inherent in cash flows (or a combination of the two) matters little for studies of event-specific earnings management. Since this negative relation is observed even for randomly chosen firms, where no systematic earnings management is expected, studies of event-specific

Table 7
Estimates from regression of abnormal accruals on cash from operations

Panel A: Jones model

	Does not exclude any observation	*Excludes observations with abs(dffits) > 2*
Intercept	−0.001	−0.0033
t-statistic	(−0.36)	(−1.48)
cfo_{it}	−0.724	−0.5621
t-statistic	(−7.22)	(−9.18)
No. of obs.	1,000	998
R-squared	55.69%	38.30%
Adj. R-squared	55.64%	38.24%

Panel B: CFO model

	Does not exclude any observation	*Excludes observations with abs(dffits) > 2*
Intercept	−0.002	−0.003
t-statistic	(−0.73)	(−1.11)
cfo_{it}	−0.115	−0.052
t-statistic	(−1.31)	(−0.90)
No. of obs.	1,000	997
R-squared	3.25%	0.56%
Adj. R-squared	3.15%	0.46%

The sample for the regressions consists of 1,000 randomly selected firm-quarters. The abnormal accruals, which is the dependent variable, is estimated using either the Jones or the CFO model. cfo_{it} is cash from operations for firm i in period t.

---

[11] We also carried out the analysis by randomly selecting 5,000 firms and then sorting the firms into quintiles based on their cash from operations. This approach does not control for the industry level of cash flows and, hence, firms in industries with high long-run levels of cash flows tend to be included in the higher cash flow quintiles even if the firm has poor cash flow performance relative to the other firms in its industry. The results from this analysis are qualitatively similar to those reported in this paper.

Figure 1
Abnormal accruals from Jones model plotted against CFO

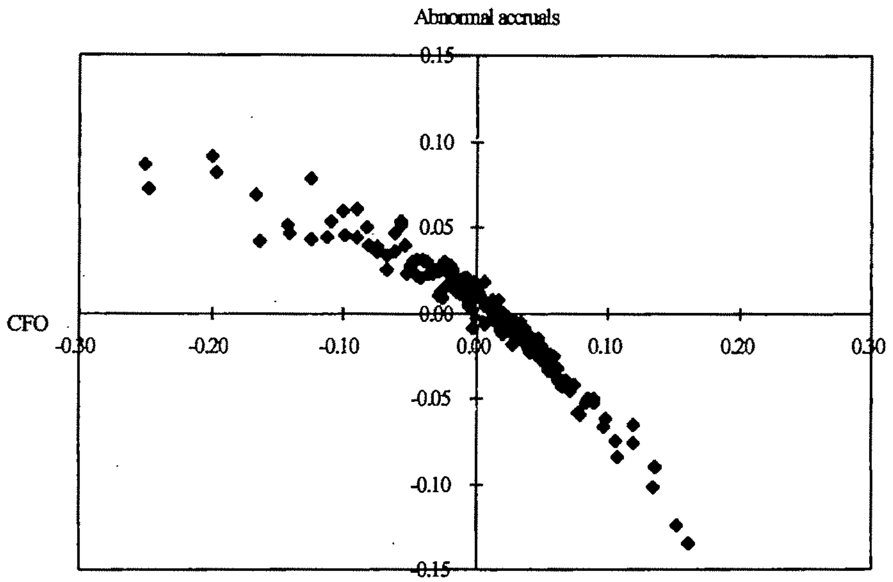
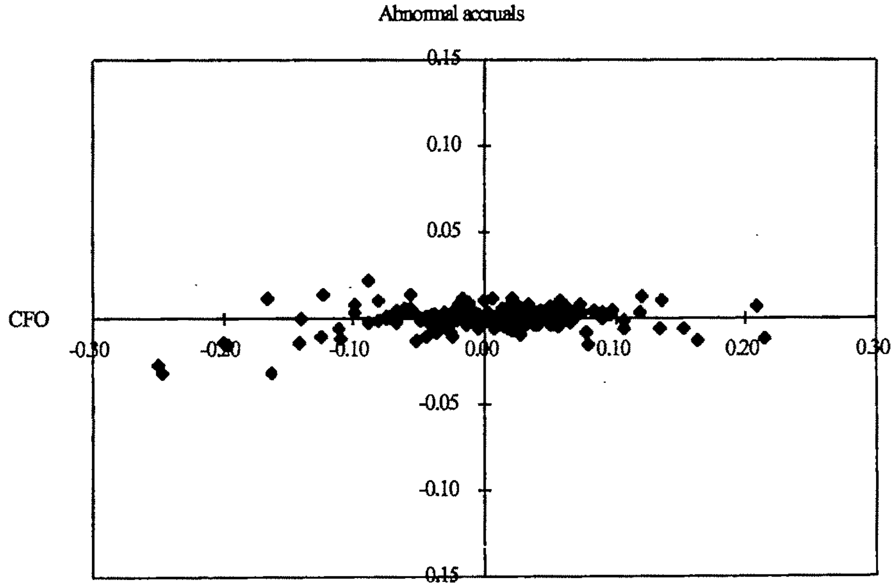


Figure 2
Abnormal accruals from CFO model plotted against CFO



The figures for above figures consists of 20000 randomly selected firm-quarters. These obsrevations are then sorted into 200 samples based on cash from operations (cfo_{it}/a_{it-1}). Figures 1 and 2, plot the sample mean for abnormal accruals against the sample mean for cash from operations. Abnormal accruals in Figure 1 are estimated using the Jones model, while those in Figure 2 are estimated using the CFO model.

earnings management should control for this relation before drawing conclusions regarding earnings management around the specific event being tested. The results also indicate that the CFO model does a fairly good job of controlling for cash flows. The CFO model is well specified for all cash flow levels and, hence, could be useful to detect earnings management around events that are correlated with abnormal cash flows for a firm.

5.4. Samples of firm-quarters with artificially induced earnings management

To evaluate the power of the accruals models in detecting earnings management, we begin with the 200 random samples of 100 firm-quarters each that are used to determine the proportion of type I errors (see Table 5). For each sampled firm, we then add three levels of accrual manipulation (1%, 2% and 5% of total assets) to the estimated abnormal accruals and to Δrev_{it}, if manipulation occurs through revenues. Our choice of the level of manipulation is guided by past research, where most studies have reported magnitudes of manipulation that vary between 1% and 5% of total assets (e.g., Shivakumar, 1997; DeAngelo, 1986, 1988).

The results from this simulation are summarised in Table 8. This table lists the frequency with which the null hypothesis is rejected using conventional test levels of 5% and 1%. For this analysis, we consider both the null hypothesis that discretionary accruals are less than or equal to zero and the null hypothesis that discretionary accruals are greater than or equal to zero. Table 8 also presents descriptive statistics of the abnormal accruals across the 200 samples used in the analyses.

Panel A reports the simulation results when the magnitude of manipulation is 1% of total assets. As expected, both the Jones and the CFO models reject the null hypothesis that discretionary accruals are less than or equal to zero more frequently than the specified test levels. Using the test level of 5%, the rejection frequency for the Jones model is 25.5% when accrual manipulation occurs through expenses. This rejection frequency almost doubles to 45% when the CFO model is used. The corresponding rejection frequencies for the two models when manipulation occurs through revenues are 38.5% and 20% for the CFO and Jones models respectively. Little difference is observed in the mean abnormal accruals between the CFO and Jones models, with the mean near 1% across all the samples. However, the standard deviation of the mean abnormal accruals across the samples is lower for the CFO model, indicating greater precision in the estimate of the level of manipulation from this model.

Panel B reports the rejection frequencies when the level of earnings management is 2% of total assets. As expected, the rejection frequencies under both models are higher than their corresponding frequencies in Panel A. The CFO model continues to reject the null hypothesis more often than the Jones model. Also, the standard deviation of the mean abnormal accruals across the samples continues to be lower for the CFO model. Finally, Panel C reports the rejection frequencies when the level of earnings management is 5% of total assets. At this level of manipulation, both the Jones model and the CFO model perform almost equally well in detecting earnings management. The mean abnormal accruals are close to 5% for both the models, but the standard deviation of these means across the samples continues to be lower for the CFO model. These results demonstrate the greater power of the CFO model in detecting accrual manipulation.

The above results suggest that the CFO model provides a significant improvement over the Jones model in detecting earnings management. This improvement is particularly noticeable when the level of manipulation is low.

Finally, to consider how the relative power of the models would be affected if discretionary accruals were correlated with operating cash flows, we performed several robustness tests. First, we examined 200 samples of 100 firm-quarters each with artificially induced earnings management, where the level of manipulation was taken as a percentage of the firm's cash from operations (-1%, -10%, or -50%) in addition to earnings management of 1% of total assets. We also introduced an asymmetric level of earnings management for firms with positive or negative operating cash flows (i.e., only firms with negative cash flows manage earnings under this assumption). In each case we observed higher rejection frequencies for the CFO model than for the Jones model, suggesting greater power in detecting earnings management.

5.5. Ability of accrual models to detect earnings management across quarters

Table 9 reports the results from analysing the discretionary accruals in each quarter for 1,000 randomly selected firm-years. This analysis is intended to examine the specification of alternative models in relation to differences in the degree of accounting discretion exercised by managers in the various quarters of the fiscal year. Panel A of Table 9 reports the descriptive statistics for the abnormal accruals, while Panel B reports the descriptive statistics for the squared abnormal accruals. Finally, Panel C of this table presents the results from comparing the squared abnormal accruals in each of the interim quarters to the squared abnormal accruals in the fourth quarter.

Recall that various explanations related to either (or both) management's incentives and oppor-

Table 8

Rejection frequencies for test of the null hypothesis of no earnings management when artificial accrual manipulation is induced

Panel A: Level of manipulation = 1%

	Expense manipulation				Revenue manipulation			
	CFO model		Jones model		CFO model		Jones model	
Specified test level	5%	1%	5%	1%	5%	1%	5%	1%
EM > = 0 (%)	45.00*	23.00*	25.50*	11.00*	38.50*	17.00*	20.00*	6.50*
EM < = 0 (%)	0.00*	0.00	0.00*	0.00	0.00*	0.00*	0.00*	0.00
Mean	0.010		0.009		0.008		0.008	
Std dev.	0.008		0.010		0.008		0.010	
t-statistic	16.57		12.91		13.65		10.54	
Proportion > 0	0.89		0.84		0.87		0.78	
Sign test (p-value)	<0.01		<0.01		<0.01		<0.01	
Quartile 3	0.015		0.016		0.013		0.013	
Median	0.011		0.009		0.009		0.008	
Quartile 1	0.005		0.002		0.003		0.001	

Panel B: Level of manipulation = 2%

	Expense manipulation				Revenue manipulation			
	CFO model		Jones model		CFO model		Jones model	
Specified test level	5%	1%	5%	1%	5%	1%	5%	1%
EM > = 0 (%)	83.50*	65.00*	63.50*	41.00*	71.50*	51.00*	51·00*	25.50*
EM < = 0 (%)	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00
Mean	0.020		0.019		0.016		0.016	
Std. dev	0.008		0.010		0.008		0.010	
t-statistic	33.78		26.89		27.97		22.22	
Proportion > 0	0.98		0.97		0.96		0.94	
Sign test (p-value)	<0.01		<0.01		<0.01		<0.01	
Quartile 3	0.025		0.026		0.021		0.022	
Median	0.021		0.019		0.017		0.016	
Quartile 1	0.015		0.012		0.011		0.009	

Panel C: Level of manipulation = 5%

	Expense manipulation				Revenue manipulation			
	CFO model		Jones model		CFO model		Jones model	
Specified test level	5%	1%	5%	1%	5%	1%	5%	1%
EM > = 0 (%)	98.50*	98.00*	99.50*	96.50*	98.00*	97.00*	96.50*	87.50*
EM < = 0 (%)	0.00*	0.00	0.00*	0.00	0.00*	0.00	0.00*	0.00
Mean	0.050		0.049		0.041		0.041	
Std dev.	0.008		0.010		0.008		0.010	
t-statistic	85.54		68.84		70.88		57.41	
Proportion > 0	1.00		1.00		1.00		1.00	
Sign test (p-value)	<0.01		<0.01		<0.01		<0.01	
Quartile 3	0.055		0.056		0.046		0.047	
Median	0.051		0.049		0.042		0.041	
Quartile 1	0.045		0.042		0.036		0.034	

*Significantly different from the specified test level at the 5% level using a two-tailed binomial test.

EM = earnings management

This analysis is based on 200 samples, each consisting of 100 randomly chosen-firm-quarters. The rejection frequencies for the null hypothesis of no earnings management are evaluated across the samples when a specified level of accrual manipulation (1%, 2% or 5% of total assets) is included for the chosen firm-quarters. When manipulation occurs using revenues, the specified level of manipulation is added to both the Δrev_{it} and to accruals (acc_{it}) in the models. For expense manipulation, only the accruals (acc_{it}) level is increased by the level of manipulation.

Table 9
Descriptive statistics on abnormal acccruals and squared abnormal accruals classified by fiscal quarter

Panel A: Abnormal accruals

	Jones model				*CFO model*			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Mean	0.002	0.003	0.001	−0.001	0.003	0.004	0.000	0.002
Std Dev	0.096	0.088	0.086	0.103	0.090	0.082	0.062	0.085
t-statistic	0.55	1.17	0.27	−0.43	0.96	1.42	−0.16	0.74
Quartile 3	0.028	0.028	0.023	0-.028	0.022	0.018	0.017	0.025
Median	0.001	0.002	−0.002	−0.002	0.005	0.004	0.003	0.003
Quartile 1	−0.029	−0.022	−0.026	−0.035	−0.012	−0.009	−0.010	−0.018
Proportion>0	0.51	0.52	0.48	0.48	0.59	0.58	0.57	0.55
Sign test	0.66	0.18	0.25	0.20	<0.01	<0.01	<0.01	<0.01

Panel B: Squared abnormal accruals

	Jones model				*CFO model*			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Mean*	0.92	0.77	0.74	1.07	0.80	0.67	0.38	0.73
Std Dev	0.06	0.04	0.06	0.06	0.05	0.11	0.04	0.05
Quartile 3*	0.44	0.29	0.29	0.44	0.16	0.09	0.08	0.23
Median*	0.08	0.06	0.06	0.10	0.03	0.02	0.02	0.05
Quartile 1*	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.01

Panel C: Differences in squared abnormal accruals between the fourth quarter and interim quarters

	Jones model			*CFO model*		
	Qtr 4- Qtr 1	Qtr 4- Qtr 2	Qtr 4- Qtr 3	Qtr 4- Qtr 1	Qtr 4- Qtr 2	Qtr 4- Qtr 3
Mean*	0.15	0.30	0.33	−0.08	0.06	0.35
Std Dev	0.08	0.07	0.08	0.07	0.12	0.06
Quartile 3*	0.16	0.23	0.23	0.09	0.13	0.14
Median*	0.000	0.011	0.009	0.002	0.008	0.009
Quartile 1*	−0.16	−0.09	−0.07	−0.04	−0.02	−0.01
Proportion>0	0.49	0.56	0.55	0.52	0.59	0.60
Sign test	0.85	<0.01	<0.01	0.03	<0.01	<0.01

*Coefficient*100

The sample for this table consists of 1,000 accruals randomly selected firm-years. Observations are included in the sample for a given firm-year only if data is available to estimate abnormal accruals of all quarters in that year.

tunities may be posited as to why abnormal accruals might be expected to vary across quarters. Our purpose is not to distinguish among these alternative explanations but rather to examine the methodological differences across quarters, if any. In so doing, we may be able to glean some insight or at least speculate as to the validity of the various arguments related to earnings management.

From Panel A of Table 9, we observe that the mean abnormal accruals are insignificantly different from zero in all the quarters for both the Jones and the CFO models. This suggests that the models are well specified for all the quarters. This finding may appear to be inconsistent with the bad news deferral argument of Mendenhall and Nichols (1988), which suggests that the discretionary accruals might be positive in interim quarters and negative in fourth quarters. However, it should be noted that the cross-sectional models are unlikely to detect the bad news deferral if such deferral is correlated across several firms within the industry. More importantly, the results suggest that the models are well specified for tests of *event-specific* earnings management. Further, the median of abnormal accruals from the CFO model is significantly positive in all four quarters. This, considered in conjunction with a mean near zero, suggests that those firms that report negative abnormal accruals may report larger (in absolute value) accruals than those firms which report positive abnormal accruals. This evidence is consistent with a 'big bath' argument, as it suggests that when discretionary accruals are negative (income decreasing), they tend to be relatively large. Firms may choose to cluster a number of negative items (write-offs, charges, etc.) into one period in the hope of improving future income. For both the Jones and the CFO models, the proportions of abnormal accruals greater than zero are lowest in the fourth quarter.

From Panel B of Table 9, we observe that the mean and the median squared abnormal accruals for both the Jones and the CFO models tend to be higher in the fourth quarter than in all other quarters. Moreover, from Panel C we find that the median squared abnormal accruals from the CFO model is significantly greater in the fourth quarter than in any of the interim quarters.[12] Similar results are obtained for the Jones model from comparing abnormal accruals in the fourth quarter with the abnormal accruals in the second and the third quarters. However, the median squared abnormal accruals for the fourth quarter estimated using the Jones model is not significantly different from that of the first quarter, possibly due to the greater noise in estimates of abnormal accruals from the Jones model.

The larger squared abnormal accruals in the fourth quarters suggest that the incentives of managers to achieve target year-end earnings or the added noise in fourth quarter accruals from correcting interim reports' estimates dominate the greater opportunities available for earnings management in interim quarters. The existence of more pronounced target-driven earnings management in the fourth quarter, despite the audited nature of the annual report, has the potential to explain both the greater discretionary accruals and the differential stock response documented by Kross and Schroeder (1990) relative to interim periods.

Regardless of which of the three reasons posited for differences across quarters (or which combination of the three) is operative, the larger squared abnormal accruals in the fourth quarters suggest that tests of event-specific earnings management may be less powerful in these quarters than in interim quarters. The extent of noise, or manipulation, in fourth quarters will also lower the power of tests using annual data in detecting earnings management around specific events.

5.6. Time-series models

To estimate the parameters of the time-series models, we required each estimation sample to have at least 10 observations from the period prior to the event period (admittedly an arbitrary cutoff). The lower number of observations used in time-series models reflects the limited availability of observations in the time-series samples and introduces a significant limitation of this analysis.[13] Hence we do not present these results but summarise them briefly. Tables are available upon request from the authors.

When we estimated the parameters of the time-series Jones model for 1,000 firm-years, we found the intercept term to be positive on average, as were the mean and the median coefficients for $\Delta \mathrm{rev}_{it}$. The average coefficient on the gppe_{it} was negative, as expected since gppe_{it} is included in the regressions to capture depreciation expense, a negative accrual. However, none of the coefficients were significant for the average regression. Further, the standard errors for intercept and gppe_{it} coefficients were very high relative to their mean and median coefficient values. Results for the time-series CFO model were similar, with the exceptions that the median coefficient for $\Delta \mathrm{rev}_{it}$ was significant for the time-series CFO model. Further, as expected, the median coefficient on cfo_{it} was significantly negative.[14]

When we estimated the incidence of type I errors for 200 randomly selected samples with 100 firm-periods in each sample, we found that the observed rejection frequencies were significantly different from zero at the 5% significance level for both the time-series Jones model and the CFO model. Both the models provided mean abnormal accruals that were significantly negative more often than would occur by chance. Finally, in contrast to the cross-sectional Jones model, the standard errors for all the parameters are relatively large, indicating greater imprecision in the parameter estimates.[15]

Since this evidence, taken as a whole, could be interpreted in one of two ways (either as model misspecification or as the result of imprecise parameter estimates yielding unreliable estimates of abnormal accruals), we do not dwell on the time-series results. Instead, we summarise them mainly as a contrast to the cross-sectional analysis presented previously. The above discussion suggests that time-series models may provide unreliable estimates of abnormal accruals when the number of observations used in estimating the parameters is small (as in the case of annual data). However, increasing the number of observations in the estimation sample raises the issue of survivorship bias. Further, as noted by Jones (1991), increasing the number of observations also raises the question of possible structural changes in the models. Hence, increasing the size of the estimation sample involves a trade-off between non-stationarity of parameters and survivorship bias on the one hand and precision of the parameter estimates on the other.

---

[12] We do not report the t-statistics for squared abnormal accruals as these are not normally distributed.

[13] Since the data requirements for time-series models differ from the data requirements for cross-sectional models, the sample firm-periods used in analyses of cross-sectional models differ from the sample firm-periods used in analyses of time-series models. Also, the samples vary for a given model and a given sample depending on whether annual or quarterly data are used in the analysis.

[14] For the time-series CFO model, we include the level of cash from operations as an explanatory variable without the indicator variables that sorted firms into cash flow quintiles in our cross-sectional CFO model.

[15] One possible explanation for the imprecision of our time-series parameter estimates is that we use only pre-event data in our time-series regressions, as we are replicating studies of actual earnings management. Dechow et al. (1995), in contrast, regressed accruals on specific variables both before and after an artificially chosen event year. This difference may cause our time-series estimates to be less precise than those of Dechow et al.

In summary, based on our analyses presented in the preceding sections, the cross-sectional estimation of the Jones and the CFO models produces results consistent with an argument that the models are well specified for randomly chosen firms, while the time-series estimation does not. However, this comparison is tempered by the limited availability of observations in the time-series samples. Finally, our findings with regard to time-series estimation are largely consistent with the concerns raised by Guay, Kothari and Watts (1996).

6. Conclusion

Since earnings management studies depend critically on having unbiased and precise estimates of abnormal accruals, we examine the specification and statistical power of cross-sectional models of expected accruals. We also introduce and test a new model that controls for the level of cash flows. Cross-sectional models, though not true substitutes for time-series models, can be highly useful to researchers examining event-specific earnings management, as they provide industry-relative measures of abnormal accruals. This paper examines the cross-sectional Jones model and evaluates the performance of this model relative to that of the CFO model, which is an extension of the Jones model.

Because our focus is on the methodology used in detecting event-specific earnings management, we do not test the performance of the models in detecting non-event-specific earnings management. For example, our CFO model would be appropriate to apply to studies investigating earnings management around import relief investigations or seasoned equity offerings, though not necessarily to studies investigating income smoothing or maximisation of managers' compensation over time.

Using a simulation analysis technique similar to that performed by Brown and Warner (1985), we show that the cross-sectional Jones model and CFO model are well specified for randomly chosen firms. However, the Jones model yields systematically positive (negative) estimates of abnormal accruals for firms with cash flows below (above) their industry median. This finding demonstrates that the misspecification of the Jones model reported by Dechow et al. (1995) is not limited to firms with extreme performances. In contrast to the Jones model, the CFO model is shown to be well specified for all cash flow levels. Further, the CFO model has greater power in detecting earnings management, particularly at lower levels of earnings manipulation.

We also examine the impact of differences in managerial incentives and abilities across fiscal quarters on the power of accrual models in detecting earnings management. For a random sample of firms, we show that squared abnormal returns are greater in the fourth quarter than in interim quarters, consistent with an argument that managers exhibit the greatest evidence of earnings management in the last quarter of a fiscal year. This is the quarter in which managers have the greatest incentives to achieve specified target levels of earnings. The difference observed may also be argued to be consistent with a settling up of interim errors or misestimates. In either case, however, the greater level of noise or manipulation in fourth quarters for reasons unrelated to a firm specific event suggests that estimates of abnormal accruals based on annual or fourth quarter data are likely to be particularly troublesome for earnings-based event studies. This finding supports the use of interim data in examining earnings management issues whenever feasible.

References

Brown, S. J. and Warner, J. B. (1985). 'Using daily stock returns: the case of event studies'. *Journal of Financial Economics*, 14: 3–31.

Belsley, D. A., Kuh, E. and Welsch, R. E. (1980). *Regression Diagnostics*, New York: John Wiley & Sons, Inc.

Chaney, P. and Lewis, C. (1995). 'Earnings management and firm valuation under asymmetric information'. *Journal of Corporate Finance*, 1: 319–345.

Chaney, P., Jeter, D. and Lewis, C. (1998). 'The use of accruals in income smoothing: a permanent earnings hypothesis'. *Advances in Quantitative Analysis of Finance and Accounting*, forthcoming.

DeAngelo, L. (1986). 'Accounting numbers as market valuation substitutes: a study of management buyouts of public stockholders'. *The Accounting Review*, 61: 400–420.

DeAngelo, L. (1988). 'Managerial competition, information costs and corporate governance: the use of accounting performance measures in proxy contests'. *Journal of Accounting and Economics*, 10: 3–36.

Dechow, P., Sabino, J. and Sloan, R. (1996). 'Implications of non-discretionary accruals for earnings management and market based research'. Working paper, University of Pennsylvania.

Dechow, P., Sloan, R. and Sweeney, A. (1995). 'Detecting earnings management'. *The Accounting Review*, 170: 193–225.

Dechow, P. (1994). 'Accounting earnings and cash flows as measures of firm performance: the role of accounting accruals'. *Journal of Accounting and Economics*, 18: 3–42.

Defond, M. L. and Jiambalvo, J. (1994). 'Debt covenant violation and manipulation of accruals'. *Journal of Accounting and Economics*, 17: 145–176.

Gaver, J. J., Gaver, K. M. and Austin, J. R. (1995). 'Additional evidence on the association between income management and earnings-based bonus plans'. *Journal of Accounting and Economics*, 9: 3–28.

Guay, W. P., Kothari, S. P. and Watts, R. L. (1996). 'A market-based evaluation of discretionary accrual models'. *Journal of Accounting Research*, 34: 83–105.

Hansen, R. and Sarin, S. (1996). 'Is honesty the best policy? An examination of security analyst behavior around seasoned equity offerings'. Working paper, Virginia Polytechnic Institute and State University.

Healy, P. (1985). 'The effect of bonus schemes on accounting decisions'. *Journal of Accounting and Economics*, 7: 85–107.

Holthausen, R., Larcker, D. and Sloan, R. (1995). 'Annual bonus schemes and the manipulation of earnings'. *Journal of Accounting and Economics*, 19: 29–74.

Jones, J. (1991). 'Earnings management during import relief investigations'. *Journal of Accounting Research*, 29: 193–228.

Kross, W. amd Schroeder, D. (1990). 'An investigation of seasonality in stock price responses to quarterly earnings announcements'. *Journal of Business, Finance and Accounting*, 649–675.

Mendenhall, R. and Nichols, W. D. (1988). 'Bad news and differential market reactions to announcements of earlier-quarters versus fourth-quarter earnings'. *Journal of Accounting Research*, 26: 63–85.

Rangan, S. (1998). 'Earnings before seasoned equity offerings: are they overstated?' *Journal of Financial Economics*. Forthcoming.

Rees, L., Gill, S. and Gore, R. (1996). 'Studies on recognition, measurement, and disclosure issues'. *Journal of Accounting Research*, 34: 157–169.

Sankar, M. R. and Subramanyam, K. R. (1997). 'GAAP consistency requirements, reporting discretion and private information communication through earnings'. Working paper, University of Southern California.

Shivakumar, L. (1997). 'Earnings management around seasoned equity offerings.' Working paper, London Business School.

Shivakumar, L. (1996). 'Essays related to equity offerings and earnings management'. Dissertation, Vanderbilt University.

Subramanyam, K. R. (1996). 'The pricing of discretionary accruals'. *Journal of Accounting and Economics*, 22: 250–281.

White, H. (1980). 'A heteroskedasticity-consistent covariance matrix estimator and a direct test of heteroskedasticity'. *Econometrica*, 48: 817–838.

Accounting and Business Research, Vol. 29. No. 4. pp. 321–335. 1999

Share price anticipation of earnings and management's discussion of operations and financing

Thomas Schleicher and Martin Walker*

Abstract—This paper combines research on the measurement of disclosure quality and the measurement of share price anticipation of earnings to produce a new test of the usefulness of the information disclosed in management discussions of operations and financing for predicting future earnings. Market-Based Accounting Research has shown that earnings changes are anticipated and impounded in prices well before the financial year for which earnings are reported. This price anticipation leads to downward biased earnings response coefficients (ERCs) in the commonly estimated regression model of returns on contemporaneous earnings changes. We exploit predictable differences in the biasedness of the ERC estimate across firm-years to test the hypothesis that share prices are better informed when the annual report contains a detailed discussion of the firm's operations and financing. Our results suggest that such voluntary disclosure may have been useful in predicting future earnings changes. The effect would appear to be strongest (1) in models that examine one-period-ahead and two-period-ahead share price anticipation and (2) when we employ a disclosure index that captures forward-looking information.

1. Introduction

This paper presents a new method for assessing the predictive value of the various discretionary disclosures firms make in their management discussions of operations and financing. This approach allows us to assess whether such disclosures lead to improved market forecasts of future earnings.

A method for assessing the predictive value of management disclosures is important from the point of view of accounting policy making and financial disclosure regulation. Policy making in these areas needs to be guided by evidence of the effects of the imposition of increasingly stringent disclosure requirements. To the extent that such requirements are premised on the predictive value of such disclosures, the method presented in this paper provides a basis for testing this premise.

The present study was, in part, inspired by the Accounting Standards Board's (ASB) issuance of a statement on the 'Operating and Financial Review' (OFR) in July 1993. This was the first time that the ASB had released a statement dealing with the mainly qualitative discussion section of the annual report. The statement was also different from previous announcements in that it was not an accounting standard but rather a codification of best practice. Accordingly, its adoption is voluntary. The statement recommends the inclusion of a primarily narrative analysis that discusses the main factors underlying the firm's operations and financial performance. The aim of such an analysis is to provide the reader with a better understanding of the nature of the business, its environment and the risks it faces. It is believed that such a discussion leads to a more accurate evaluation of the firm's prospects. This idea is explicitly stated in the introduction to the OFR statement: 'It [the OFR] would therefore give the users of the annual report a more consistent foundation on which to make investment decisions regarding the company' (ASB, 1993).

Little empirical evidence, however, has been produced to date that could support such a claim. The only notable exception is a recent study in the context of the US equivalent of the OFR, the Management Discussion and Analysis (MD&A) section of the annual report. Botosan (1997) finds higher levels of voluntary disclosure reduce the cost of equity capital for firms with low analyst following. She argues that the inverse relation is a result of either lower estimation risk on the part of investors or lower transactions costs due to better informed market participants.

---

*The authors would like to thank Ian Garrett, Len Skerratt, Norman Strong, Stuart Turley, the editor (Ken Peasnell) and two anonymous referees for helpful comments on this research. Financial support from the Association of Chartered Certified Accountants (ACCA) is gratefully acknowledged. Correspondence should be addressed to Mr T. Schleicher, Manchester School of Accounting & Finance, University of Manchester, Crawford House, Precinct Centre, Oxford Road, Manchester M13 9PL. The final version of the paper was accepted in January 1999.

This paper approaches the question from a different angle. It seeks to test directly whether increased discretionary disclosure levels in the published annual report result in a better informed stock market. Better informed is interpreted here as referring to the ability of the market to anticipate earnings changes.

To measure the extent to which share prices anticipate earnings we exploit the theoretical framework established by Kothari (1992) and Donelly and Walker (1995) to investigate the association between a measure of the firm's disclosure quality and the extent to which share prices anticipate earnings changes.

The quality of discretionary disclosures is measured by a disclosure index. This tool has been widely used in prior research to determine factors that influence the corporate supply of voluntary information (e.g. Firth, 1979, Cooke, 1992, Wallace, Naser and Mora, 1994). In the present paper three different discretionary disclosure indices are constructed and tested for their usefulness in predicting future earnings changes: (1) the disclosure index 'Operating and Financial Review' (DOFR) reflects management's discussion of aspects that relate to the financial year under review, (2) the index 'Operating and Financial Projections' (DOFP) captures information on factors that are expected to affect future financial years and (3) the index 'Segmental Information' (DSEG) measures the comprehensiveness of the analysis.

A novel feature of this paper is that it relates disclosure indices, as measures of disclosure quality, to a stock return-based measure of the predictive ability of the market.

The remainder of the paper is organised as follows. The share price anticipation literature is reviewed in the next section. Section three explains the construction of the disclosure indices and justifies our operational definitions. Empirical models are presented in section four. Section five describes the sample selection procedures, defines our variables and reports descriptive statistics. Section six presents and discusses our results. Robustness tests are also described here. The final section concludes and indicates lines for further research.

2. Share price anticipation literature

Beaver, Lambert and Morse (1980) and Beaver, Lambert and Ryan (1987) presented the first systematic evidence of prices containing a richer information set than the past time series of earnings. They show that prices can be used to extract information not included in the past history of earnings when accounting earnings contain value-irrelevant noise.

Subsequent studies, however, have focused more on the lack of timeliness of earnings in capturing value-relevant events as an explanation for prices leading earnings. Kothari and Sloan (1992) and Donnelly and Walker (1995), for example, have shown that prices incorporate value-relevant events up to four years earlier than earnings. The lagged response of earnings is ascribed to (1) certain accounting conventions like objectivity, conservatism and verifiability which prevent earnings from reflecting value-relevant events on a timely basis and (2) the aggregation of daily/weekly/monthly/quarterly earnings into annual earnings.[1]

Several studies have investigated analytically how earnings' lack of timeliness affects the statistical performance of the commonly estimated regression model of returns on current year's earnings change deflated by beginning-of-period price. This return-earnings specification can be written formally as (e.g. Christie 1987):

$$R_t = a + b\frac{(X_t - X_{t-1})}{P_{t-1}} + e_t \qquad (1)$$

where R_t is the (unexpected) return on equity in period t, X_t is the firm's earnings per share in period t, P_{t-1} is the share price at the beginning of period t, e_t is a disturbance term, and a and b are the regression parameters to be estimated; b is usually referred to as the earnings response coefficient.

Kothari (1992) has shown that share price anticipation of earnings leads to downward biased earnings response coefficient estimates for model (1). This bias is greater for firm-years which have a relatively large proportion of their earnings change predicted in earlier periods. Donnelly and Walker (1995), in extending Kothari's argument, pointed out that cross-firm variations in the ERC estimates produced by model (1) can be exploited to measure differences in the extent to which prices lead earnings. The following sections provide a formal summary of these arguments.

Following Kothari (1992) and Donnelly and Walker (1995) we assume:

(i) a 100% dividend payout
(ii) a constant cost of capital, r
(iii) reported earnings follow a random walk

$$X_t - X_{t-1} = x_t + Lx_t \qquad (2)$$

where Lx_t is a shock observed in period t-1 and x_t is a shock observed in period t; these two terms are assumed to be uncorrelated white noise random variables with constant variances

---

[1] Further evidence is presented in Collins, Kothari and Rayburn (1987) and Kothari and Zimmerman (1995). Collins et al. (1994) investigate the relative importance of noise and lack of timeliness for the low explanatory power of the contemporaneous return-earnings relation. More recently, Basu (1997) has shown that positive news are reflected in earnings on a less timely basis than negative news.

(iv) the ex-div price per share at time point t equals the discounted present value of future dividends.

The above assumptions imply the following exact expression for the (ex-div) share price at time t:

$$P_t = \frac{1}{r} E_t(X_{t+1}) = \frac{1}{r}(X_t + Lx_{t+1}) \qquad (3)$$

From (3) one can derive the following expression:

$$\frac{P_t - P_{t-1}}{P_{t-1}} = \frac{1}{r}\frac{X_t - X_{t-1}}{P_{t-1}} + \frac{1}{r}\frac{Lx_{t+1}}{P_{t-1}} - \frac{1}{r}\frac{Lx_t}{P_{t-1}} \qquad (4)$$

Equation (4) implies that deflated price change will be exactly equal to *1/r* times the deflated earnings change only if the variance of Lx_t is zero. In this case a regression of deflated price changes on deflated earnings changes would yield a perfect fit and an unbiased estimate of the true earnings response coefficient, i.e. *1/r*.

If Lx_t has a strictly positive variance then the third and fourth terms in (4), which are not observable by the researcher, will introduce noise into the regression. Moreover, the resultant regression estimate of *l/r* is biased downwards, because the term Lx_t is positively correlated with X_t-X_{t-1}. The term Lx_{t+1}/P_{t-1} also introduces nosie into the model, but it is not troublesome with regard to biasing the estimate of the earnings response coefficient, because it is not correlated with the current change in earnings.

The important general point that emerges from (4) is that the ERC estimate produced by regressing the price relative, P_t/P_{t-1}, on the deflated earnings change is downward biased if and only if share prices anticipate earnings. The research design of this paper exploits this theoretical result by allowing the ERC estimate to vary with the quality of financial disclosure. If higher quality financial disclosure enables the market to better anticipate future earnings then, in a panel of firms with equal costs of equity capital, the estimated ERC should be negatively related to the level of disclosure.[2, 3]

3. Disclosure quality

The aim of our study is to examine the association between prices leading earnings and the quality of management's discussion of operational and financial aspects. To measure the disclosure quality in this part of the annual report, we construct three different disclosure indices. Two indices, Operating and Financial Review (DOFR) and Operating and Financial Projections (DOFP), contain similar items, but refer to different time periods. Items in DOFR capture the discussion of aspects that relate predominantly to the year under review. In contrast, items in DOFP report on known events after the year-end or comment on trends and uncertainties that are expected to prevail in future financial years. The third index, Segmental Reporting (DSEG), measures the comprehensiveness of the discussion, a feature that has been largely neglected (or assumed away) in previous disclosure studies. Companies score here only if they supply a certain piece of information for the majority of segments. The following subsections discuss briefly the four steps involved in constructing the disclosure indices. Further details are contained in Schleicher (1996).

Item selection. Several sources have been consulted in the process of selecting the items. The most important source was the detailed guidance section included in the ASB statement 'Operating and Financial Review'. Where applicable, we have included the recommended items in both the backward-looking (DOFR) and the forward-looking (DOFP) index. Further guidance on the relevance of individual items was provided by 'The Corporate Report' (ASSC, 1975), 'Making Corporate Reports Valuable' (ICAS, 1988) and previous annual report disclosure studies.[4] The reason for constructing a separate forward-looking index is that we expect a discussion of future-orientated aspects to be particularly useful in predicting future earnings changes. The questionnaire results in Weetman, Collins and Davie (1994) clearly support such a view.

The composition of our indices is exemplified in Table 1 which shows the 82 items in the index DOFR. Companies usually provide information for the group as a whole and in relation to individual segments. Accordingly, we introduce separate items for each aggregation level. For information on individual segments we have introduced two items depending on the comprehensiveness of the given disclosure. The company scores under 'some divisions/areas' if it reveals the information for at least one of its segments. If the respective information is disclosed for a majority of the segments mentioned in its discussion section, then an addi-

---

[2] This representation of share price anticipation, which assumes the market can partially anticipate permanent shocks, differs from the Beaver, Lambert and Morse representation, which assumes that earnings contain value-irrelevant noise which is observed by the market. We have not attempted to construct a general model which would allow for both types of phenomenon.

[3] The discussion so far has ignored differences in true ERCs across firms or over time. This point will be addressed below.

[4] See e.g., Cerf (1961), Singhvi and Desai (1971), Buzby (1974), Chandra (1974), Wallace (1988), Cooke (1989, 1992).

tional score is awarded under 'all major divisions/areas'. This additional item has been introduced to penalise those companies that give only selected information. But clearly, one cannot expect each item to be applicable in each division or area. A majority is therefore considered an appropriate compromise.

We have also differentiated between prose and quantitative items. Qualitative and quantitative items are assessed separately, resulting in scores under both items only if numerical figures are supplemented with verbal explanations.

The smaller number of items in the DOFP index (64 against 82) is largely a result of our decision not to differentiate between narrative and numerical items for some classes of information in this index. With hindsight, this decision has proved reasonable because the information was given in almost all cases only in narrative form.

Scores awarded under 'all major divisions/areas' are counted once again to form the third index, Segmental Reporting (DSEG). DSEG measures the disclosure quality without assuming that quantity equals quality. Its construction can be regarded as a test of an assumption underlying the first two indices. Most of the items in DSEG (32 out of 34) are included in either DOFR or DOFP.[5]

Weighting methodology. The disclosure indices constructed in this study are equally-weighted. Support for this weighting scheme can be found in previous disclosure studies which employ both an equally-weighted and an importance-weighted index. They show that the disclosure index methodology is insensitive to the choice of the weighting scheme. In none of the surveyed six cases did the choice between the two alternatives alter the research findings, and in most cases the differences in the measured disclosure levels are minimal.[6]

Index aggregation and evaluation. A dichotomous scale has been chosen to evaluate the individual items. An item is regarded as disclosed or not disclosed, and accordingly a score of one or zero is assigned to the company's scoring sheet. The aggregation model used in this study is additive. An additive model can be formally justified by assuming, first, that the utilities of the different criteria are (at least) conditionally independent of each other and, second, that the metric scales used to measure the partial utilities of all criteria are identical. Clearly, these assumptions are quite strong and, to the extent that they are not satisfied, the power of our tests will be reduced, i.e. we are less likely to reject the null.

In evaluating management's disclosure quality the following operational definitions apply: (1) Items are treated as being disclosed regardless of the section of the annual report in which the item is found. A similar assessment style is used in Weetman and Collins (1996) for their assessment of the firm's OFR. Accordingly, we have analysed the entire annual report. (2) The assumption with respect to relevance and materiality is that the selected items are generally relevant and material. Items for which the applicability criterion was questionable have been deleted from the list or have been combined with other related items in such a way that at least one aspect of this broader class was almost certain to be applicable. (3) In some cases different pieces of information are subsumed under the same item (e.g. 'employment' and 'trading deficit' under 'major macroeconomic variables'). If the company provides information on several of those aspects but of different quality, then the piece of information with the highest quality is taken into account. (4) The financial year-end is the borderline to divide past from future information. Information on events that occurred after the year-end but before the statements were approved by the board of directors are included in the forward-looking index DOFP.

4. Empirical models

Our study investigates the economic consequences of both cross-sectional and intertemporal variations in the disclosure quality. Focusing also on variations over time enables us to make predictions of how within-firm changes in the disclosure quality affect the extent to which prices lead earnings. Such an interpretation of the regression results is generally not possible with a research design that uses a cross-section only. Therefore, we have analysed eleven annual reports over a 22-year period for each of the 20 selected firms.

The first set of results is based on the following specification:

$$\begin{aligned} P_{it}/P_{it-1} = {} & \sum_t (a_t\, DV_t) + a_{DOFR}\, DVOFR_{it} + \\ & a_{DOFP}\, DVOFP_{it} + a_{DSEG}\, DVSEG_{it} + \\ & \sum_t (b_t\, DV_t\, (X_{it} - X_{it-1})/P_{it-1}) + \\ & b_{DOFR}\, DVOFR_{it}\, (X_{it} - X_{it-1})/P_{it-1} + \\ & b_{DOFP}\, DVOFP_{it}\, (X_{it} - X_{it-1})/P_{it-1} + \\ & b_{DSEG}\, DVSEG_{it}\, (X_{it} - X_{it-1})/P_{it-1} + e_{it} \end{aligned} \tag{5}$$

where the subscript *i* refers to firm i, DV_t is a dummy variable for year t and $DVOFR_{it}$ ($DVOFP_{it}$, $DVSEG_{it}$) is a dummy variable that differentiates between high and low disclosure quality in

---

[5] The other two items are 'new products and technologies—all major divisions/areas' and 'current research and development—all major divisions/areas'.

[6] See Choi (1973), Barrett (1977), Spero (1979), McNally and Hasseldine (1982), Robbins and Austin (1986) and Chow and Wong-Boren (1987).

Table 1
Composition of index 'Operating and Financial Review'

Discussion of firm's result for the current year
1. sales - group
2. sales - some divisions/areas
3. sales - all major divisions/areas
4. profit - group
5. profit - some divisions/areas
6. profit - all major divisions/areas
7. taxation

Discussion of capital structure & liquidity
8. assets
9. borrowings
10. shareholders' funds
11. internal sources
12. external sources

Interest rate & foreign currency exposure
13. exposure - prose
14. exposure - financial
15. managing exposure - prose
16. managing exposure - financial

Capital expenditure
17. past - group - prose
18. past - some divisions/areas - prose
19. past - all major divisions/areas - prose
20. past - group - financial
21. past - some divisions/areas - financial
22. past - all major divisions/areas - financial
23. past - other - financial

Major acquisitions and disposals
24. past - prose
25. past - financial
26. past - breakdown of consideration - net assets
27. past - breakdown of consideration - financing

Customer information
28. past - major customers/large contracts - prose
29. past - major customers/large contracts - physical
30. past - major customers/large contracts - financial
31. sales by customers - some divisions/areas
32. sales by customers - all major divisions/areas

Volume statistics
33. physical level of sales - some divisions/areas
34. physical level of sales - all major divisions/areas

Major products
35. some divisions/areas
36. all major divisions/areas

Capacity utilisation
37. past - group - prose
38. past - some divisions/areas - prose
39. past - all major divisions/areas - prose
40. past - group - quantitative
41. past - some divisions/areas - quantitative
42. past - all major divisions/areas - quantitative

Market share
43. past - group - prose
44. past - some divisions/areas - prose
45. past - all major divisions/areas - prose
46. past - group - quantitative
47. past - some divisions/areas - quantitative
48. past - all major divisions/areas - quantitative

Selling prices
49. past - group - prose
50. past - some divisions/areas - prose
51. past - all major divisions/areas - prose
52. past - group - quantitative
53. past - some divisions/areas - quantitative
54. past - all major divisions/areas - quantitative

Raw material prices
55. past - group - prose
56. past - some divisions/areas - prose
57. past - all major divisions/areas - prose
58. past - group - quantitative
59. past - some divisions/areas - quantitative
60. past - all major divisions/areas - quantitative

Supply of raw materials - sources
61. past - group - prose
62. past - some divisions/areas - prose
63. past - all major divisions/areas - prose
64. past - group - quantitative
65. past - some divisions/areas - quantitative
66. past - all major divisions/areas - quantitative

Major macroeconomic variables
67. past - national - prose
68. past - other areas - prose
69. past - national - quantitative
70. past - other areas - quantitative

Major industry trends
71. past - group - prose
72. past - some divisions/areas - prose
73. past - all major divisions/areas - prose
74. past - group - quantitative
75. past - some divisions/areas - quantitative
76. past - all major divisions/areas - quantitative

Major warehouses, plants and properties
77. location
78. age of plants etc.
79. square metres of plants

Other information
80. political issues
81. note on company's history
82. organisation chart

the part of the annual report covered by the index DOFR (DOFP, DSEG). High disclosure firm-years are given a value of one. Regression equation (5) allows for time-varying intercepts and ERCs. Support for this specification can be found in Collins and Kothari (1989), Board and Walker (1990) and Strong and Walker (1993).

We have converted the disclosure scores into dummy variables for two reasons. Firstly, this recognises the problems associated with transforming an ordinal scale into an interval scale. Also, this reflects our belief that disclosing information only in some selected areas might not necessarily lead to a deeper understanding of the firm's position. To be classified as a high disclosure firm-year, the annual report must consistently supply more information. Secondly, defining dummy variables facilitates the interpretation of the regression parameters which are of interest in our study (i.e. b_{DOFR}, b_{DOFP} and b_{DSEG}).

We estimate six variants of specification (5). These variants differ in the hypothesised time span between the publication of the annual report and the resulting impact on the ERC estimate. Consequently, we use different lags of the disclosure quality to define the disclosure dummy variables. The following definitions apply:

- variant (1): contemporaneous disclosure quality
- variant (2): one-period lagged disclosure quality
- variant (3): two-period lagged disclosure quality
- variant (4): three-period lagged disclosure quality
- variant (5): four-period lagged disclosure quality
- variant (6): five-period lagged disclosure quality.

In the first variant the contemporaneous disclosure scores determine the dummy variables. However, we would not expect lower ERC estimates for high disclosure firm-years in this model, and we include it only to show that results in subsequent models are not spurious. The reason for predicting no association is that annual reports are released in the first three to four months of the following financial year (i.e. t+1). Consequently, an informative discussion section in the annual report for period t cannot be helpful in predicting period t's earnings change. If the discussion is news to the market, then it will induce price revisions in period t+1 and the corresponding earnings change might occur in period t+1 or later.

Another realistic scenario is that the firm's discussion only summarises information that had already been released in period t via other channels (e.g. press releases). In this case the return occurs in period t and the associated earnings change occurs either in period t or later. But again, no part of period t's earnings change is predicted as a result of the annual report for period t.

The second variant of (5) uses the one-period lagged disclosure quality to define the three disclosure dummy variables in period t. If the discussion is news to the market, then we would expect no significant parameters on the three interaction variables of interest. However, if the discussion is 'stale', then we might observe a negative association. It should be noted that this second scenario also prevents us from unambiguously ascribing any negative relationship to the 'annual report' medium itself. We estimate a further four variants of regression (5) by increasing the number of lags to five. This cut-off point has been chosen because previous research has shown that no significant share price anticipation occurs beyond $t-4$.[7] Consistent with previous empirical evidence we hypothesise the strongest relationship in variants (3) and (4) under the 'news' scenario and in models (2) and (3) under the 'summary' scenario. Such a result corresponds to one-period-ahead and two-period-ahead share price anticipation. In both cases any negative association should gradually level off as higher lags are used to define the disclosure dummy variables.

Specification (5) ignores differences in the true ERC between firms and over time. Collins and Kothari (1989) show that ERCs increase in earnings growth and persistence and decrease in interest rates and systematic risk. Hence, the absolute size of the ERC estimate might not be an appropriate measure for prices leading earnings. To control, at least in part, for such differences, we estimate a second set of models with the end-of-period market value included as a control for firm size. Kothari and Zimmerman (1995) argue that market values serve as a summary proxy for omitted variables in return-earnings specifications. In particular, we expect the size variable to be positively correlated with persistence and negatively correlated with systematic risk.

5. Sample selection, variable definition and descriptive statistics

Sample selection. The present study is part of a larger research project concerned with the development of UK accounting between the mid 1960s and early 1990s. This project collected share price and accounting data for 94 firms that were quoted on the LSE from 1964 to 1993. This sample inevitably involves some survivorship bias.

From the 94 firms involved in the larger study, we selected 20 companies from the engineering and electronic and electrical equipment sectors. For these companies we constructed disclosure indices using the annual reports from 1975, and every other year thereafter up to 1993. A 1996 update was subsequently added to our sample. By that time two companies had been taken over and, for these, we included the latest available annual reports for 1996 (03/95 and 04/96, respectively).[8] Thus our full sample contained data for 220 company-years.[9]

---

[7] Also, increasing the number of lags steadily reduces the sample size.

The size of the study sample was limited by the substantial costs involved in constructing the disclosure indices. Each company-year costs approximately 0.5 man days. Because of the need to limit the sample size we decided to focus on a sample drawn from firms in related industrial sectors. In this way we hoped to produce a sample which was reasonably homogeneous except for differences in the level of disclosure, and firm size (which we control for).

Variable definition. We collected share price data, market values and earnings per share from Datastream. The earnings per share measure is Datastream item 183 which is item 182 'earnings for ordinary—full tax' divided by the number of shares outstanding. However, until 1992 Datastream reported a value of zero under item 183 if total earnings were negative. In this case we constructed the EPS number by dividing item 182 by the appropriate number of shares (also provided by Datastream). Datastream adjusts share prices for subsequent rights/scrip issues. The price relatives P_{it}/P_{it-1} are calculated over a 12-month period to the end of the financial year and are exclusive of dividends. This definition is consistent with our theoretical model, which assumes firms pay out all earnings as dividends. In practice firms do not pay out all earnings and so it could be argued that we should have used stock returns instead of price relatives. We have no reason to believe that the use of price relatives instead of stock returns could materially influence our main findings.[10] The market values are collected at the end of the financial year and are converted into fractional ranks. This is done separately for each year. The disclosure scores are transformed into dummy variables in two steps. We first subtract the mean value of the respective year from the disclosure score. The resulting deviations are then allocated to two categories. The high (above average) and low (below average) disclosure groups contain almost the same number of observations.

Descriptive statistics. The descriptive statistics for all six variants are included in Table 2. It should be noted that share prices, earnings per share and market values in variants (3) and (5) are, apart from year 1995, a sub-sample of variant (1). Similarly, except for 1996, all data in variants (4) and (6) are included in variant (2). It is clear that the odd years outperformed the even years in terms of capital gains and earnings growth. The distribution of real market values indicates that there is substantial variation in firm size within our sample. The upward trend in disclosure scores over time results in lower mean values when the most recent years are excluded from the regression.[11]

One might be concerned with a panel data approach in the context of an annual report disclosure study because disclosure scores in successive years are not independent of each other. Table 3 reports for each of the 20 sample companies the number of high disclosure firm-years. We observe some variation for the indices DOFR and DSEG. However, there is substantial variation for the forward-looking index DOFP. Only two firms have the same classification in 10 years or more.

6. Results and discussion

Table 4 contains the results for the first set of models. For comparison we also include the coefficients for the corresponding regressions without disclosure dummy variables. We only report the average values of time-varying intercepts and ERCs. The brackets contain heteroskedasticity-consistent standard errors.[12]

---

[8] The participating companies are: ASTEC (BSR), Brooke Tool Engineering, BSG International (now Britax), Cohen (A) & Co, Delta, Eis Group, ERF (Holdings), Glynwed International, Hopkinsons (now Carbo), Howden, Johnson Matthey, Locker (T) Holdings, Morgan Crucible, Neepsend, Renold, Rubicon, Sterling Industries, Vickers, Wagon Industrial, Wellman. The number of firms in each of the three industry sectors is 16 (engineering, general), two (engineering, vehicle) and two (electronic and electrical equipment). All selected firms have constant financial year-ends. Annual reports are allocated to the calendar year in which the majority of months fall. One advantage from not having a uniform financial year is that any potential cross-sectional dependence problems are mitigated (see footnote 12).

[9] The annual reports were obtained on microfiche from Companies House.

[10] Recall that we define the price relative for the financial year, and that our main independent variable is the CHANGE in earnings. The price relative differs from the stock return for the financial year because the return formula includes in the numerator any dividends paid during the year, i.e. the final dividend for the previous year plus the interim dividend for the current year. Our results will only be sensitive to the exclusion of dividends if the level of dividends (deflated by opening share price) is correlated with the deflated CHANGE in earnings. There is no reason to expect any such correlation. For sake of completeness we have calculated the level of correlation between the annual price relatives and the annual returns for the 423 company-years for which we had easy access to LSPD returns. The result was a Pearson correlation of 0.977.

[11] For a discussion of the developments in reporting practice over time see Schleicher (1996, 1998). Using all 220 observations, the Pearson correlation coefficients are 0.553 (DOFR/DOFP), 0.845 (DOFR/DSEG) and 0.665 (DOFP/DSEG). All correlation coefficients are significant at 0.000. The dummy variables are also significantly (and positively) related.

[12] Bernard (1987) points out that cross-sectional dependence in this type of regression can lead to biases in the OLS standard errors. To check against this we calculate the correlation of the residuals for each pair of companies. For all regressions in Tables 4 and 5 the 190 correlations were symmetrically distributed around the means. The 24 mean (median) values lie between −0.051 and −0.039 (−0.090 and −0.019).

Table 2
Descriptive statistics

				Percentile					
Variable	*Period*	*Obs.*	*Mean*	*1%*	*25%*	*50%*	*75%*	*99%*	*STD*
Panel A: Contemporaneous disclosure quality									
P_{it}/P_{it-1}	1975-96	220	1.257	0.408	0.908	1.130	1.449	3.560	0.572
$(X_{it}-X_{it-1})/P_{it-1}$	1975-96	220	0.064	−0.269	−0.018	0.012	0.049	1.089	0.380
MV	1975-96	220	105.6	1.5	7.9	32.8	128.7	640.4	154.6
DOFR	1975-96	220	0.201	0.024	0.122	0.183	0.268	0.451	0.099
DOFP	1975-96	220	0.137	0.016	0.094	0.133	0.180	0.328	0.068
DSEG	1975-96	220	0.105	0.000	0.027	0.108	0.162	0.324	0.083
Panel B: One-period lagged disclosure quality									
P_{it}/P_{it-1}	1976-94	200	1.106	0.277	0.848	1.043	1.301	2.990	0.443
$(X_{it}-X_{it-1})/P_{it-1}$	1976-94	200	0.002	−0.684	−0.026	0.006	0.036	0.587	0.161
MV	1976-94	200	96.9	1.2	7.2	32.5	118.7	591.8	141.4
DOFR	1975-93	200	0.191	0.024	0.122	0.183	0.256	0.415	0.094
DOFP	1975-93	200	0.133	0.016	0.078	0.125	0.172	0.344	0.068
DSEG	1975-93	200	0.098	0.000	0.027	0.081	0.162	0.324	0.081
Panel C: Two-period lagged disclosure quality									
P_{it}/P_{it-1}	1977-95	199	1.209	0.398	0.911	1.123	1.408	3.893	0.507
$(X_{it}-X_{it-1})/P_{it-1}$	1977-95	199	0.072	−0.269	−0.008	0.014	0.044	1.161	0.395
MV	1977-95	199	110.2	1.5	8.1	35.5	127.0	803.1	159.3
DOFR	1975-93	199	0.191	0.024	0.122	0.183	0.256	0.415	0.094
DOFP	1975-93	199	0.133	0.016	0.078	0.125	0.172	0.359	0.068
DSEG	1975-93	199	0.098	0.000	0.027	0.081	0.162	0.324	0.081
Panel D: Three-period lagged disclosure quality									
P_{it}/P_{it-1}	1978-96	198	1.108	0.272	0.842	1.039	1.333	3.000	0.452
$(X_{it}-X_{it-1})/P_{it-1}$	1978-96	198	−0.012	−0.760	−0.029	0.004	0.025	0.401	0.145
MV	1978-96	198	112.3	1.2	8.4	38.5	135.1	681.2	161.4
DOFR	1975-93	198	0.191	0.024	0.122	0.177	0.256	0.415	0.094
DOFP	1975-93	198	0.132	0.016	0.078	0.125	0.172	0.359	0.068
DSEG	1975-93	198	0.098	0.000	0.027	0.081	0.162	0.324	0.082
Panel E: Four-period lagged disclosure quality									
P_{it}/P_{it-1}	1979-95	179	1.179	0.398	0.883	1.108	1.400	3.440	0.478
$(X_{it}-X_{it-1})/P_{it-1}$	1979-95	179	0.077	−0.269	−0.008	0.014	0.044	1.161	0.416
MV	1979-95	179	115.7	1.6	7.6	40.4	127.0	803.1	165.6
DOFR	1975-91	179	0.185	0.024	0.110	0.171	0.256	0.415	0.092
DOFP	1975-91	179	0.131	0.016	0.078	0.125	0.172	0.359	0.067
DSEG	1975-91	179	0.094	0.000	0.027	0.081	0.135	0.297	0.079
Panel F: Five-period lagged disclosure quality									
P_{it}/P_{it-1}	1980-96	178	1.089	0.272	0.824	1.025	1.329	2.979	0.440
$(X_{it}-X_{it-1})/P_{it-1}$	1980-96	178	−0.013	−0.760	−0.027	0.004	0.031	0.401	0.151
MV	1980-96	178	118.0	1.2	7.9	41.0	135.5	681.2	167.8
DOFR	1975-91	178	0.185	0.024	0.110	0.171	0.256	0.415	0.093
DOFP	1975-91	178	0.131	0.016	0.078	0.125	0.172	0.360	0.068
DSEG	1975-91	178	0.094	0.000	0.027	0.081	0.135	0.297	0.079

The different sets of statistics relate to the six variants of specification (5). The price relatives (P_{it}/P_{it-1}) are calculated over a 12-month period to the end of the financial year and are exclusive of dividends. Earnings per share (X_{it}) are after-tax earnings for ordinary shareholders as adjusted by Datastream (item 183). End-of-period market values (MV) are deflated by the retail price index (1987 = 100). The disclosure index 'Operating and Financial Review' (DOFR) reflects management's discussion of aspects that relate to the financial year under review. DOFP ('Operating and Financial Projections') captures information on factors that are expected to affect future financial years. The index 'Segmental Information' (DSEG) measures the comprehensiveness of the analysis.

Table 3
Firm's variation in disclosure quality over time

No of years Classified as high disclosure firm	*DVOFR*	*DVOFP*	*DVESG*
0	3	—	3
1	3	—	2
2	1	2	2
3	2	5	2
4	1	2	1
5	2	1	—
6	—	4	1
7	—	—	—
8	—	2	2
9	1	2	2
10	1	1	2
11	6	1	3

DVOFR, DVOFP and DVSEG are dummy variables that differentiate between high and low disclosure quality in the part of the annual report covered by the disclosure indices DOFR ('Operating and Financial Review'), DOFP ('Operating and Financial Projections') and DSEG ('Segmental Information'). The table reports for each of the 20 selected companies the number of high disclosure firm-years. This classification is based on 11 observations between 1975 and 1996.

The results for the two indices DOFR (backward looking) and DSEG (segmental disclosures) partly support our predictions. For b_{DOFR} we find a significantly negative coefficient of -0.988 in model variant (4). However, we also observe significantly positive coefficients in models (2) and (6). In variant (6) we expected a gradual levelling off of any negative association. Also, the signs of the coefficients for b_{DOFR} generally do not move in the predicted direction as higher lags are used to determine the dummy variables. This observation is also true for b_{DSEG}. The results for the forward-looking index DOFP, however, are more encouraging. We predicted the strongest results for this index because of the future-orientated nature of investments. It is also the index which we feel most confident about as a result of the significant variation in disclosure quality over time. Consistent with the 'news' scenario we find negative coefficients for b_{DOFP} in models (3) and (4). The coefficient of -1.340 in model (4) is significant at the 10% level and the estimate in variant (3) is 'almost' significant (t-value of -1.481).

Banz (1981) shows that larger companies tend to have lower systematic risk. Donnelly and Walker (1995) provide evidence that firm size and earnings persistence are positively correlated for UK firms. We would therefore expect a positive association between market values and 'true' earnings response coefficients. This correlation results in an underestimation of prices leading earnings in Table 4 if market values are also positively related to the disclosure quality. In line with previous research we find significantly positive correlations for all three indices. The problem is most serious for the indices DOFR and DSEG.[13]

Table 5 includes end-of-period market values both as a separate variable and interacted with $(X_{it}-X_{it-1})/P_{it-1}$. The coefficients on the interaction variable, $MV_{RANK}(\Delta X_{it}/P_{it-1})$, are positive and significant in four variants. The estimates on the interacted disclosure dummies are now generally lower. As hypothesised, we obtain no significant coefficient for b_{DOFR}, b_{DOFP} and b_{DSEG} in model (1). When we use the one-period lagged disclosure quality, the estimate of -0.542 for b_{DSEG} is significant at the 10% level and has the predicted sign. Again, we obtain the strongest results in models (3) and (4). All three significant coefficients are negative. To illustrate the economic significance of our results, assume that the average ERC is between 6 and 7. The coefficient of -2.035 for b_{DOFP} in model (3) then means that an informative discussion of future-orientated aspects in the annual report for period t-2 leads, on average, to one third of the earnings change in period t being anticipated in t-1.

---

[13] Using all annual reports between 1975 and 1996, the Pearson correlation coefficients between the real market value and the disclosure index values are 0.634 (DOFR), 0.247 (DOFP) and 0.555 (DSEG). The corresponding values between the real market value and the standardised (i.e. mean corrected) disclosure scores are 0.572 (DOFR), 0.191 (DOFP) and 0.482 (DSEG). Finally, the correlation coefficients between the ranked (nominal) market value and the disclosure dummy variables are 0.648 (DVOFR), 0.288 (DVOFP) and 0.531 (DVSEG). All coefficients are significant at levels between 0.005 and 0.000.

Table 4
Estimation results of OLS regression: without size control

Model	Period	Obs.	ave. Intercept	a_{DOFR}	a_{DOFP}	a_{DSEG}	MV_{RANK}	ave. ERC	b_{DOFR}	b_{DOFP}	b_{DSEG}	MV_{RANK} $(\Delta X_{it}/P_{it-1})$	ADJ R^2	Wald Test
Panel A: Contemporaneous disclosure quality														
(1)	1975-96	220	1.204					1.607					0.341	
(1)	1975-96	220	1.198	0.189^b	−0.058	−0.124		0.694	−1.084	0.898	2.283^b		0.381	3.00
				(0.088)	(0.049)	(0.093)			(1.054)	(0.659)	(0.967)			
Panel B: One-period lagged disclosure quality														
(2)	1976-94	200	1.103					1.923					0.305	
(2)	1976-94	200	1.161	−0.076	−0.070	0.032		1.624	0.669^b	0.600	-0.592^b		0.311	2.14
				(0.070)	(0.057)	(0.076)			(0.304)	(0.502)	(0.289)			
Panel C: Two-period lagged disclosure quality														
(3)	1977-95	199	1.143					2.041					0.333	
(3)	1977-95	199	1.148	-0.163^b	0.001	0.146^a		2.297	−0.361	−0.953	0.435		0.334	2.14
				(0.074)	(0.051)	(0.082)			(1.263)	(0.643)	(1.265)			
Panel D: Three-period lagged disclosure quality														
(4)	1978-96	198	1.112					1.982					0.288	
(4)	1978-96	198	1.180	-0.218^b	−0.079	0.150		2.725	-0.988^b	-1.340^a	0.750		0.342	4.07
				(0.102)	(0.056)	(0.096)			(0.405)	(0.785)	(0.665)			
Panel E: Four-period lagged disclosure quality														
(5)	1979-95	179	1.114					2.032					0.376	
(5)	1979-95	179	1.085	−0.015	0.019	0.051		2.596	−0.313	0.191	-1.519^b		0.415	2.06
				(0.081)	(0.054)	(0.075)			(0.644)	(0.658)	(0.738)			
Panel F: Five-period lagged disclosure quality														
(6)	1980-96	178	1.093					1.574					0.225	
(6)	1980-96	178	1.158	0.160^b	−0.057	-0.218^c		1.636	2.678^d	−0.942	-0.882^b		0.299	2.09
				(0.075)	(0.054)	(0.082)			(0.764)	(0.698)	(0.345)			

The regression models relate to the six variants of specification (5). The period refers to the time interval for which share prices, earnings per share and market values are collected. The price relatives (P_{it}/P_{it-1}) are calculated over a 12-month period to the end of the financial year and are exclusive of dividends. Earnings per share (X_{it}) are after-tax earnings for ordinary shareholders as adjusted by Datastream (item 183). Disclosure scores are transformed into dummy variables in two steps. Scores are adjusted for the upward trend in reporting practice over time. The resulting deviations are then classified as high and low disclosure firm-years. Coefficients are estimated on the three disclosure dummy variables (a_{DOFR}, a_{DOFP} and a_{DSEG}) and on three variables which interact the disclosure dummy variables with the deflated earnings change (b_{DOFR}, b_{DOFP} and b_{DSEG}). Only the average values of time-varying intercepts and ERCs are reported. Brackets indicate heteroskedasticity-consistent standard errors. The significance levels are: a = 10% level, b = 5% level, c = 1% level, d = 0.1% level (two-tail test). The Wald statistic tests whether the average coefficient on the three interacted disclosure dummy variables (i.e. b_{DOFR}, b_{DOFP}, and b_{DSEG} is significantly different from zero. It is asymptotically distributed as chi-square with one degree of freedom. The critical values for the 10%, 5% and 1% confidence levels are: 2.71, 3.84 and 6.63. The test corrects for heteroscedasticity and has been calculated using SAS/IML.

Table 5
Estimation results of OLS regression: with size control

Model	Period	Obs.	ave. Intercept	a_{DOFR}	a_{DOFP}	a_{DSEG}	MV_{RANK}	ave. ERC	b_{DOFR}	b_{DOFP}	b_{DSEG}	MV_{RANK} $(\Delta X_{it}/P_{it-1})$	ADJ R^2	Wald Test
Panel A: Contemporaneous disclosure quality														
(1)	1975-96	220	1.052				0.259^{c} (0.090)	0.256				4.770^{d} (0.863)	0.479	
(1)	1975-96	220	1.093	0.114 (0.109)	−0.079 (0.048)	−0.126 (0.093)	0.269^{a} (0.162)	−0.174	−1.096 (0.811)	0.728 (0.544)	0.506 (0.770)	5.138^{d} (1.189)	0.480	0.02
Panel B: One-period lagged disclosure quality														
(2)	1976-94	200	1.048				0.093 (0.081)	1.625				1.043 (0.834)	0.306	
(2)	1976-94	200	1.051	-0.182^{b} (0.081)	−0.079 (0.056)	0.008 (0.077)	0.324^{c} (0.116)	1.440	0.432 (0.304)	0.459 (0.534)	-0.542^{a} (0.292)	0.983 (0.941)	0.332	0.47
Panel C: Two-period lagged disclosure quality														
(3)	1977-95	199	1.062				0.121^{a} (0.068)	0.474				5.423^{d} (0.789)	0.531	
(3)	1977-95	199	1.059	-0.195^{c} (0.074)	0.011 (0.046)	0.126^{a} (0.072)	0.180^{a} (0.099)	1.150	0.006 (0.513)	-2.035^{d} (0.548)	−0.219 (0.609)	5.979^{d} (0.733)	0.573	21.44
Panel D: Three-period lagged disclosure quality														
(4)	1978-96	198	1.042				0.124 (0.082)	1.488				1.712 (1.146)	0.295	
(4)	1978-96	198	1.030	-0.339^{c} (0.110)	−0.089 (0.055)	0.092 (0.097)	0.449^{d} (0.126)	2.372	-0.986^{c} (0.376)	-1.448^{b} (0.702)	0.726 (0.588)	1.659 (1.172)	0.390	5.41
Panel E: Four-period lagged disclosure quality														
(5)	1979-95	179	1.029				0.118^{a} (0.069)	0.511				5.318^{d} (0.814)	0.604	
(5)	1979-95	179	1.010	−0.098 (0.078)	0.049 (0.050)	0.054 (0.062)	0.143 (0.110)	0.957	-0.857^{d} (0.248)	0.035 (0.313)	-0.489^{a} (0.265)	5.447^{d} (0.535)	0.631	11.61
Panel F: Five-period lagged disclosure quality														
(6)	1980-96	178	1.002				0.159^{a} (0.087)	0.876				2.369^{a} (1.270)	0.245	
(6)	1980-96	178	1.029	0.065 (0.082)	−0.052 (0.053)	-0.283^{d} (0.077)	0.381^{c} (0.128)	1.139	2.482^{d} (0.692)	-1.187^{a} (0.684)	-0.909^{c} (0.324)	2.238^{a} (1.263)	0.342	0.45

The regression models relate to the six variants of specification (5). The period refers to the time interval for which share prices, earnings per share and market values are collected. The price relatives (P_{it}/P_{it-1}) are calculated over a 12-month period to the end of the financial year and are exclusive of dividends. Earnings per share (X_{it}) are after-tax earnings for ordinary shareholders as adjusted by Datastream (item 183). End-of-period market values (MV_{RANK}) are ranked for each year separately. Disclosure scores are transformed into dummy variables in two steps. Scores are adjusted for the upward trend in reporting practice over time. The resulting deviations are then classified as high and low disclosure firm-years. Coefficients are estimated on the three disclosure dummy variables (a_{DOFR}, a_{DOFP} and a_{DSEG}) and on three variables which interact the disclosure dummy variables with the deflated earnings change (b_{DOFR}, b_{DOFP} and b_{DSEG}). Only the average values of time-varying intercepts and ERCs are reported. Brackets indicate heteroskedasticity-consistent standard errors. The significance levels are: a = 10% level, b = 5% level, c = 1% level, d = 0.1% level (two-tail test). The Wald statistic tests whether the average coefficient on the three interacted disclosure dummy variables (i.e. b_{DOFR}, b_{DOFP}, and b_{DSEG} is significantly different from zero. It is asymptotically distributed as chi-square with one degree of freedom. The critical values for the 10%, 5% and 1% confidence levels are: 2.71, 3.84 and 6.63. The test corrects for heteroscedasticity and has been calculated using SAS/IML.

The results in Table 5 generally support the predictions made earlier. All but one of the significant coefficients are negative and we obtain the strongest results for the forward-looking index DOFP. However, the significantly negative estimates for b_{DOFP} and b_{DSEG} in model (6) are surprising, since previous research has shown that share price anticipation in period t-4 is minimal (e.g. Kothari and Sloan, 1992). Moreover, the highly significant estimate of 2.482 for b_{DOFR} is not in line with our predictions. A possible explanation is that, in the absence of any downward bias due to prices leading earnings, the index DOFR only picks up differences in the true ERC. The positive correlation between DOFR and DSEG might also affect the results. These two explanations are also consistent with the results in variant (1).

Finally, we observe that for DOFP the downward bias is most pronounced in models (3) and (4), whereas the statistically significant estimates of b_{DOFR} are lowest in models (4) and (5). This suggests that the information captured by our prediction index relates more to the immediate future (e.g. next year's turnover) whereas the information in DOFR is long-term in nature (e.g. capital expenditure). This is indeed the impression one gets from reading the annual report discussion section. If the management makes any predictions at all, then they do not extend beyond the near future.

Tables 4 and 5 also report a Wald statistic which tests whether the average coefficient on the three interacted disclosure dummy variables is significantly different from zero. The results in Table 5, which we regard as our main results, indicate clear rejection of the null for model variants (3), (4) and (5). The insignificant test statistic in variant (2) is consistent with the 'news' scenario.

Robustness tests. We assessed the sensitivity of our results by carrying out several specification tests: (A) We ranked the beginning-of-period market values rather than the values at the year-end. We also used the log of the real market value instead of ranked nominal values. In both cases the estimates of b_{DOFR}, b_{DOFP} and b_{DSEG} in Table 5 remain virtually unchanged. (B) All six models in Tables 4 and 5 were re-estimated using only the 120 annual reports between 1975 and 1985. In this case the sample size remains constant across all six variants. Also, possible distortions as a result of the new EPS definition under FRS 3 are avoided by excluding observations beyond May 1991. The standard errors are generally higher, but the three estimates of interest are similar to those reported above. (C)

We also estimated all regressions with only one disclosure index variable included at a time. The results are largely similar to those reported in Tables 4 and 5. In those cases where they are different, they are generally more in line with our prediction and confirm our impression that multi-collinearity is responsible for some of the inconsistent results in Tables 4 and 5. In particular, all six coefficients corresponding to model variants (3) and (4) in Table 5 are negative and five are statistically significant. The two estimates for b_{DOFP} in model (5) are now negative and statistically significant in Table 5. Also, the estimates of b_{DOFR} and b_{DOFP} in variant (6) of Table 5 are no longer significant. (D)

Finally, we altered the classification rule for high and low disclosure firm-years. Only the top third of the annual reports were assigned a value of one. Some parameter estimates for b_{DOFR} are now different from those above, but the coefficients are imprecisely measured. In some cases the standard errors are up to three times higher than the values in Tables 4 and 5. The estimates for b_{DOFP} and their standard errors, however, are remarkably stable, and this is particularly true for Table 5.

The final specification test is reported in Table 6.[14] This table reports the results of pooled regressions which 'control' for time variation in the regression by including the return on the market index as an independent variable. All the parameters in this regression are required to be constant across firms and over time. In addition the parameters on the three disclosure intercept dummies, but not the interaction terms, are constrained to be zero, i.e. consistent with the theoretical model. The results for this specification are broadly similar to those reported in Table 5. The interaction terms in model variant (1) are not significantly negative, as predicted by our model, and model variant (3) continues to yield a significant indication of one-year-ahead earnings anticipation.

7. Conclusion

This study combines the disclosure index methodology with some findings in Market-Based Accounting Research. The aim was to investigate whether an informative discussion of operational and financial aspects helps to explain differences in prices leading earnings. The results suggest that such voluntary disclosure may have been useful in predicting future earnings changes that are value-relevant. The effect would appear to be strongest (1) in models that examine one-period-ahead and two-period-ahead share price anticipation and (2) when we employ a disclosure index that captures forward-looking information. The results for the forward-looking index indicate that up to one third of future earnings changes are anticipated

---

[14] We are most grateful to an anonymous referee for suggesting this additional robustness test.

Table 6
Estimation results of OLS regression: robustness test

Model	Period	Obs.	Intercept	FTALL	a_{DOFR}	a_{DOFP}	a_{DSEG}	MV_{RANK}	ERC	b_{DOFR}	b_{DOFP}	b_{DSEG}	MV_{RANK} $(\Delta X_{it}/P_{it-1})$	ADJ R^2	Wald Test
Panel A: Contemporaneous disclosure quality															
(1)	1975-96	220	−0.090	1.069^d				0.090	−1.133^c				4.657^d	0.377	
			(0.184)	(0.147)				(0.090)	(0.422)				(1.278)		
(1)	1975-96	220	−0.088	1.054^d				0.098	−1.244^c	−0.424	0.869^d	0.304	4.712^d	0.404	1.99
			(0.182)	(0.146)				(0.087)	(0.390)	(0.564)	(0.260)	(0.601)	(1.234)		
Panel B: One-period lagged disclosure quality															
(2)	1976-94	220	−0.182	1.096^d				0.077	0.588				1.671	0.215	
			(0.238)	(0.205)				(0.097)	(0.372)				(1.067)		
(2)	1976-94	200	−0.206	1.133^d				0.055	0.893^a	0.779	0.236	−0.912	1.144	0.239	0.02
			(0.228)	(0.197)				(0.100)	(0.458)	(0.563)	(0.560)	(0.553)	(1.361)		
Panel C: Two-period lagged disclosure quality															
(3)	1977-95	199	0.039	1.009^d				−0.012	−1.316^c				5.194^d	0.256	
			(0.275)	(0.231)				(0.083)	(0.442)				(1.340)		
(3)	1977-95	199	−0.086	1.080^d				0.004	−0.100	−0.122	−1.446^c	−0.591^a	7.236^d	0.459	10.30
			(0.215)	(0.189)				(0.072)	(0.405)	(0.416)	(0.529)	(0.325)	(1.117)		
Panel D: Three-period lagged disclosure quality															
(4)	1978-96	198	−0.099	1.021^d				0.094	0.606				2.008	0.215	
			(0.252)	(0.211)				(0.103)	(0.530)				(1.441)		
(4)	1978-96	198	−0.129	1.054^d				0.090	1.285^b	−1.498^b	−0.814	0.821	2.125	0.267	5.57
			(0.235)	(0.199)				(0.093)	(0.639)	(0.744)	(1.063)	(0.977)	(1.727)		
Panel E: Four-period lagged disclosure quality															
(5)	1979-95	179	0.026	0.993^d				0.014	−1.243^c				4.937^d	0.287	
			(0.322)	(0.274)				(0.086)	(0.468)				(1.463)		
(5)	1979-95	179	0.044	0.943^c				0.050	−1.495^c	−0.051	0.567^b	0.341	5.470^d	0.329	1.91
			(0.316)	(0.288)				(0.083)	(0.475)	(0.473)	(0.286)	(0.380)	(1.489)		
Panel F: Five-period lagged disclosure quality															
(6)	1980-96	178	−0.263	1.119^d				0.157	0.199				2.909^b	0.243	
			(0.242)	(0.219)				(0.096)	(0.433)				(1.448)		
(6)	1980-96	178	−0.240	1.094^d				0.170^a	0.624	1.521	−0.708	−1.020^a	2.645	0.269	0.04
			(0.234)	(0.210)				(0.094)	(0.461)	(0.963)	(0.733)	(0.546)	(1.806)		

The regression models relate to the six variants of specification (5). The period refers to the time interval for which share prices, earnings per share and market values are collected. The price relatives (P_{it}/P_{it-1}) are calculated over a 12-month period to the end of the financial year and are exclusive of dividends. Earnings per share (X_{it}) are after-tax earnings for ordinary shareholders as adjusted by Datastream (item 183). End-of-period market values (MV_{RANK}) are ranked for each year separately. FTALL is calculated by dividing the end-of-period FT All Share Index by the corresponding value at the beginning of the financial year. Disclosure scores are transformed into dummy variables in two steps. Scores are adjusted for the upward trend in reporting practice over time. The resulting deviations are then classified as high and low disclosure firm-years. Coefficients are then estimated on the three variables which interact the disclosure dummy variables with the deflated earnings change (b_{DOFR}, b_{DOFP} and b_{DSEG}). Intercept and earnings response coefficient are common to all firm-years. Brackets indicate heteroskedasticity-consistent standard errors. The significance levels are: a = 10% level, b = 5% level, c = 1% level, d = 0.1% level (two-tail test). The Wald statistic tests whether the average coefficient on the three interacted disclosure dummy variables (i.e. b_{DOFR}, b_{DOFP}, and b_{DSEG} is significantly different from zero. It is asymptotically distributed as chi-square with one degree of freedom. The critical values for the 10%, 5% and 1% confidence levels are: 2.71, 3.84 and 6.63. The test corrects for heteroscedasticity and has been calculated using SAS/IML.

and priced by the market as a result of (narrative) predictions made by the firm's management.

Some caveats, however, apply to our study. Firstly, the cross-section we used is relatively small. Secondly, the concentration on three related industry sectors does not necessarily allow a generalisation across other industries. Thirdly, our results do not unambiguously imply that the source of the forward-looking information was the annual report itself. The information may have been made available through informal channels before the publication of the annual report. This scenario is more likely for the last few years of our sample, for which it is known that the kind of issues that figure in the OFR are often the subject of private company meetings with investment professionals.

Our research design emphasises the demand side of voluntary disclosure. We believe that this is a logical extension to previous disclosure studies that mainly focus on the supply side. Our research design could be extended to test the information content of individual classes of information which have been subsumed in our disclosure indices.

References

Accounting Standards Board (ASB) (1993). 'Operating and Financial Review', in Institute of Chartered Accountants in England and Wales. *Accounting Standards 1997–98*.

Accounting Standards Steering Committee (ASSC) (1975). *The Corporate Report*.

Banz, R. (1981). 'The relationship between return and market value of common stocks'. *Journal of Financial Economics*, 9: 3–18.

Barrett, M. E. (1997). 'The extent of disclosure in annual reports of large companies in seven countries'. *International Journal of Accounting Education and Research*, 12 (2): 1–25.

Basu, S. (1997). 'The conservatism principle and the asymmetric timeliness of earnings'. *Journal of Accounting and Economics*, 24: 3–37.

Bernard, V. L. (1987). 'Cross-sectional dependence and problems in inference in Market-Based Accounting Research'. *Journal of Accounting Research*, 25 (1): 1–48.

Beaver, W. H., Lambert, R. A. and Morse, D. (1980). 'The information content of security prices'. *Journal of Accounting and Economics*, 2: 3–28.

Beaver, W. H., Lambert, R. A. and Ryan, S. G. (1987). 'The information content of security prices: a second look'. *Journal of Accounting and Economics*, 9: 139–57.

Board, J. L. G. and Walker, M. (1990). 'Intertemporal and cross-sectional variation in the association between unexpected accounting rates of return and abnormal returns'. *Journal of Accounting Research*, 28 (1): 182–92.

Botosan, C. (1997). 'Disclosure level and the cost of equity capital'. *Accounting Review*, 72 (3): 323–49.

Buzby, St. L. (1974). 'Selected items of information and their disclosure in annual reports'. *Accounting Review*, 49 (3): 423–35.

Cerf, A. R. (1961). *Corporate Reporting and Investment Decisions*. University of California Press.

Chandra, G. (1974). 'A study of the consensus on disclosure among public accountants and security analysts'. *Accounting Review*, 49 (4): 733–42.

Choi, F. D. S. (1973). 'Financial disclosure and entry to the European capital markets'. *Journal of Accounting Research*, 11 (2): 159–75.

Chow, Ch. W. and Wong-Boren, A. (1987). 'Voluntary financial disclosure by Mexican corporations'. *Accounting Review*, 62 (3): 533–41.

Christie, A. A. (1987). 'On cross-sectional analysis in accounting research'. *Journal of Accounting and Economics*, 9: 231–58.

Collins, D. A. and Kothari, S. P. (1989). 'An analysis of intertemporal and cross-sectional determinants of earnings response coefficients'. *Journal of Accounting and Economics*, 11: 143–81.

Collins, D. A., Kothari, S. P. and Rayburn, J. D. (1987). 'Firm size and the information content of prices with respect to earnings'. *Journal of Accounting and Economics*, 9: 111–38.

Collins, D. A., Kothari, S. P., Shanken, J. and Sloan, R. G. (1994). 'Lack of timeliness and noise as explanations for the low contemporaneous return-earnings association'. *Journal of Accounting and Economics*, 18: 289–324.

Cooke, T. E. (1989). 'Disclosure in the corporate annual reports of Swedish companies'. *Accounting and Business Research*, 19 (74): 113–24.

Cooke, T. E. (1992). 'The impact of size, stock market listing and industry type on disclosure in the annual reports of Japanese listed corporations'. *Accounting and Business Research*, 22 (87): 229–37.

Donnelly, R. and Walker, M. (1995). 'Share price anticipation of earnings and the effect of earnings persistence and firm size'. *Journal of Business Finance and Accounting*, 22: 5–18.

Firth, M. (1979). 'The impact of size, stock market listing, and auditors on voluntary disclosure in corporate annual reports'. *Accounting and Business Research*, 9 (36): 273–80.

Institute of Chartered Accountants of Scotland (ICAS) (1988). *Making Corporate Reports Valuable*.

Kothari, S. P. (1992). 'Price-earnings regressions in the presence of prices leading earnings'. *Journal of Accounting and Economics*, 15: 173–202.

Kothari, S. P. and Sloan, R. G. (1992). 'Information in prices about future earnings'. *Journal of Accounting and Economics*, 15: 143–171

Kothari, S. P. and Zimmerman, J. L. (1995). 'Price and return models'. *Journal of Accounting and Economics* 20: 155–92.

McNally, G. M., Eng, L. N. and Hasseldine, C. R. (1982). 'Corporate financial reporting in New Zealand: an analysis of user preferences, corporate characteristics and disclosure practices for discretionary information'. *Accounting and Business Research*, 13 (49): 11–20.

Robbins, W. A. and Austin, K. R. (1986). 'Disclosure quality in government financial reports: an assessment of the appropriateness of a compound measure'. *Journal of Accounting Research*, 24 (Supplement): 412–21.

Schleicher, T. (1996). *Corporate financial disclosure and share price anticipation of earnings*. M.Phil diss., University of Manchester.

Schleicher, T. (1998). *Developments in corporate financial disclosure over the period 1975–96: evidence from UK annual reports*. Occasional Research Paper No. 21, Association of Chartered Certified Accountants.

Singhvi, S. S. and Desai, H. B. (1971). 'An empirical analysis of the quality of corporate financial disclosure'. *Accounting Review*, 46 (1): 129–38.

Spero, L. L. (1979). 'The extent and causes of voluntary disclosure of financial information in three European capital markets: an exploratory study'. PhD diss., Graduate School of Business, Harvard University.

Strong, N. and Walker, M. (1993). 'The explanatory power of earnings for stock returns'. *Accounting Review*, 68 (2): 385–99.

Wallace, R. S. O. (1988). 'Corporate financial reporting in Nigeria'. *Accounting and Business Research*. 18 (72): 352–62.

Wallace, R. S. O., Naser, K. and Mora, A. (1994). 'The relationship between the comprehensiveness of corporate annual reports and firm characteristics in Spain. *Accounting and Business Research*, 25 (97): 41–53.

Weetman, P., Collins, B. and Davie, E. (1994). *Operating and financial review: views of analysts and institutional investors.* Edinburgh: ICAS.

Weetman, P. and Collins, B. (1996). *Operating and financial review: experiences and exploration.* Edinburgh: ICAS.

Accounting and Business Research, Vol. 29. No. 4. pp. 337–352. 1999

Corporate governance: from accountability to enterprise

Helen Short, Kevin Keasey, Mike Wright and Alison Hull*

Abstract—This paper discusses the development of the corporate governance debate in the UK since the formation of the Cadbury Committee to the recent reports of the Hampel Committee within the context of a general corporate governance framework. It identifies the changing emphasis in this period between accountability and enterprise aspects of governance. The literature relating to accountability and enterprise is reviewed in terms of the key areas of governance (board structure, directors' remuneration, directors' ownership, institutional shareholders; auditors, auditing and accounting information; and the market for corporate control). Issues of substitutability and complementarity of governance mechanisms are also examined. The paper argues that although there has been a shift in emphasis towards enterprise, there is a need for further rigorous UK-based research to underpin this development. Areas for future research are identified.

1. Introduction

Corporate governance issues, arising from the agency problems engendered by the separation of ownership and control and the inability to write complete contracts for all possible future eventualities (Hart, 1995; Shleifer and Vishny, 1997), have been recognised for many decades, if not centuries (Smith, 1776; Marshall, 1920; Berle and Means, 1932). The events which led to the establishment of the Cadbury Committee in 1991 gave a fresh impetus to this debate. Recognising this resurgence of interest in corporate governance, *Accounting and Business Research* in 1993 published a special issue devoted to corporate governance and accountability. At that time, the final draft of the report of the Cadbury Committee (1992) had just been published. The main thrust of the Committee's recommendations were directed towards issues of control and accountability. However, since the publication of the Cadbury Report, there has been considerable criticism that these recommendations are too prescriptive, focus too much on the accountability aspects of governance and risk damaging the spirit of enterprise necessary for commercial and economic success.

The successor body to the Cadbury Committee, the Hampel Committee, was set up in November 1995 and issued its final report in January 1998. In response to the criticisms levelled at Cadbury, the Hampel Report (1998) argued that while accountability by public companies was essential, the emphasis on accountability had obscured business prosperity, 'the most important aspect of corporate performance', and stated that it wished to see the balance between business prosperity and accountability corrected. Furthermore, the Report argued that the 'box-ticking' approach to the Code adopted by many companies and their shareholders had led to the belief that accountability itself would deliver success. The overriding emphasis of the Hampel Report is the need for good corporate governance to be based on principles rather than prescription.

Between the publication of the Cadbury Report and the Hampel Report and in response to public disquiet over high levels and large increases in directors' remuneration, the Greenbury Committee was set up in January 1995 by the Confederation of British Industry (CBI) at the request of the government. The Greenbury Report and Code of Best Practice on the determinants of directors' remuneration was issued in July 1995. Hence, to date, there are three codes of practice aimed at improving governance in the UK. Following the publication of the Hampel Report, the Hampel Committee has produced a document providing a set of principles and codes to embrace the Cadbury, Greenbury and Hampel recommendations—the Combined Code (Committee on Corporate Governance, June 1998).

The purpose of this paper is to examine how the corporate governance debate has developed since the publication of the Cadbury Report within the context of a general framework of corporate governance. In particular, the paper will focus on how the debate has shifted from a focus on accountability to the need for governance systems to pro-

---

* Mike Wright and Alison Hull are at the International Institute of Banking and Financial Services, University of Leeds; Kevin Keasey and Helen Short are at the Centre for Management Buy-out Research, University of Nottingham Business School. The authors wish to thank the editor and an anonymous referee for comments on an earlier draft. Correspondence should be addressed to Professor D. M. Wright, School of Management and Finance, University of Nottingham, University Park, Nottingham NG7 2RD. Email: Mike.Wright@nottingham.ac.uk This paper was accepted in May 1999.

vide structures and incentives to allow business enterprise and prosperity to flourish. The paper argues that this shift in emphasis, as embodied in the Hampel Report, is based on a paucity of UK evidence relating to the relationships between governance, accountability and enterprise. As this paper documents, there is a growing body of US literature which examines the relationships between governance, accountability and enterprise, and which provides empirical evidence that governance structures do affect the entrepreneurial activities of the firm. However, given the significant differences between the governance systems in the UK and US, US findings may not be directly applicable to the UK context. Therefore, this paper stresses the need for UK-based research on the complex relationships between governance, accountability and enterprise and proposes areas of future research in the UK context.

The paper is structured as follows. Section 2 considers the relationship between accountability and enterprise within a general corporate governance framework. Section 3 examines the key dimensions of the governance process (board structure, directors' remuneration, directors' ownership, institutional shareholders, auditors, auditing and accounting information, and the market for corporate control) and reviews the theoretical and empirical evidence in respect of their relationship to accountability and enterprise. Section 4 provides conclusions and directions for further research.

2. Corporate governance: accountability versus enterprise

Building on the arguments advanced by Tricker (1984), Keasey and Wright (1993) emphasised the need to view corporate governance as having two broad dimensions. First, the monitoring of management performance and ensuring accountability of management to shareholders emphasises the stewardship and accountability dimensions of corporate governance. Second, governance structures and processes need to encompass mechanisms for motivating managerial behaviour towards increasing the wealth of the business; that is, to enhance enterprise.

This framework recognises that while accountability is essential, it should not be enforced without recognising the need to allow an organisation to create wealth for its stakeholders. Moreover, it also recognises that enterprise and the pursuit of wealth creation should not be allowed to progress in an unfettered manner, but in recognition of the fact that effective accountability to stakeholders is necessary.

In the context of this framework, UK governance policy has been criticised as being too prescriptive and focusing too much on accountability to the detriment of enterprise. The Cadbury Committee's terms of reference were limited to reviewing 'those aspects of corporate governance specifically related to financial reporting and accountability' (para. 1.2), and as a result, the main thrust of its recommendations were directed towards issues of control and accountability. Nevertheless, the Cadbury Report recognised that a system of good corporate governance allows boards of directors to be 'free to drive their companies forward, but exercise that freedom within a framework of effective accountability' (para. 1.1). The Hampel Report noted, however, that 'the single overriding objective' of companies is 'the preservation and greatest practical enhancement over time of their shareholders' investment' (Hampel, 1998, para. 1.16).

From an agency perspective, the need to establish an appropriate corporate governance framework arises because the separation of ownership and control produces agency problems stemming from the inability to write complete contracts for all possible future eventualities (Hart, 1995). As a result, management are able to pursue their own objectives at the expense of those shareholders. The term 'corporate governance' has come to embrace those devices, mechanisms and structures which act as a check on managerial self-serving behaviour (John and Senbet, 1998). However, the purpose of checking self-serving behaviour is to promote the efficient operation of the firm. Devices employed to reduce self-serving behaviour and hence improve accountability cannot be seen as efficient if they also hamper the performance of the firm. 'Good' corporate governance, therefore, can be seen as referring to the mix of those devices, mechanisms and structures which provide control and accountability while promoting economic enterprise and corporate performance. It is far from clear that the recommendations of the various corporate governance codes act to achieve 'good governance' from both the accountability *and* enterprise perspectives. Both perspectives need to be considered when attempting to create governance structures and procedures which lead to improved performance. However, the assumed link between corporate governance and corporate performance is not one which is universally accepted. For example, the preliminary report of the Hampel committee (1997) noted that 'it is important to recognise that there is no hard evidence to link success to good governance, although we believe good governance enhances that prospect' (para. 1.2.).

The corporate governance framework outlined by Keasey and Wright (1993) suggests that effective governance involves a multi-faceted set of activities involving institutional investors, insider and outsider board membership, executives with appropriate incentive-based remuneration, board committees, auditing, the market for corporate control, etc. A particularly important issue to consider is the extent to which certain governance mechanisms affect both the accountability and enterprise activities of the company. Governance mechanisms may be substitutes and/or complements in this respect, and a full analysis needs to consider whether the relationships between alternative governance mechanisms enhance accountability to the detriment of essential enterprise activity. The remainder of this paper considers issues of corporate governance, with the emphasis being on whether the system of corporate governance operating in the UK allows the goals of accountability and enterprise to be jointly achieved.

3. Dimensions of corporate governance

This section examines the key mechanisms of the corporate governance framework and considers whether the mechanisms and structure operating in the UK allow the goals of enterprise and accountability to be jointly achieved. Following the corporate governance framework identified by Keasey and Wright (1993), the key mechanisms considered are directors and the board (including board structure, directors' remuneration and directors' ownership); institutional shareholders; auditors, auditing and accounting information; and the market for corporate control. This section concludes by considering the extent to which governance mechanisms interact as substitutes and/or complements within a corporate governance system.

3.1. Directors and the board

3.1.1. Board structure

Concerns regarding the effectiveness of the UK corporate governance system reflect in part a failing of internal corporate control mechanisms. The main internal control mechanism is that provided by the board of directors, with a key issue being the balance of internal and external directors. In contrast to US practice, the majority of boards of UK companies are dominated by executive directors, hence blurring the distinction between directors and management.

Non-executive directors (NEDs), or outside directors,[1] have two roles: strategic advisor and corporate watchdog. A key area of debate is the conflicting nature of these roles; namely, can the same individual perform both roles effectively? Fama (1980) and Fama and Jensen (1983) argue that NEDs have incentives to monitor the activities of executive directors by virtue of their need to maintain their reputations as 'decision experts' in the labour market for NEDs. However, a well-functioning labour market in NEDs may be compromised where the hiring of NEDs by executive directors leads to a high value being placed on NEDs with a reputation for 'not rocking the boat'. Although the Cadbury Report placed great reliance on the role of NEDs as independent monitors of executive directors, this role may be compromised by the inherent conflict of interest arising from the dependence of NEDs on executive directors for their appointment and terms of remuneration (Davis and Kay, 1983; Kay and Silbertson, 1995). A significant body of US research examines the monitoring role of NEDs, for example in relation to top management turnover (Weisbach, 1988), in relation to the adoption of poison pills (Brickley et al., 1994) and in relation to tender offers (Byrd and Hickman, 1992) and suggest that NEDs do appear to improve accountability in crisis situations.

However, Baysinger and Butler (1985) argue that boards dominated by outside directors could actually harm shareholders' interests by placing too much emphasis on their monitoring role at the expense of their decision-making and advisory roles. The Hampel Report (1998) recognised that an unintended side effect of the Cadbury Committee's emphasis on NEDs had been the over-emphasis on the monitoring role of NEDs (para. 3.7). Baysinger and Hoskisson (1990) argue that outside directors may have a potentially negative impact on corporate entrepreneurship. Outside directors may emphasise short-term performance through their reliance on financial evaluation of the business, resulting from their weaker access to the detailed firm-specific information necessary to evaluate the longer term strategic performance of the firm. Hoskisson et al., (1995) argue that outside directors may favour expansion via external means, such as acquisitions to enter new markets, as these are better suited to evaluation using financial criteria. Inside directors may prefer to engage in internal innovation because while internal innovation may be more risky and difficult to evaluate in a financial sense, inside directors have more strategic knowledge of the potential outcomes of internal innovation and hence view such innovation as being less uncertain than external innovation. Given that many empirical studies (see, for example, Chiplin and Wright, 1987; Hughes, 1993, and O'Sullivan, 1997, for reviews) report the poor performance of acquisitions, the potential for outside directors to favour such a means of development is a significant factor to consider when formulating corporate governance guidelines that focus on the monitoring role of outside directors.

---

[1] The terms NED and outside director are used interchangeably in this paper, the former generally being used in the UK and the latter generally being used in the US.

John and Senbet (1998) argue that the effectiveness of board monitoring is determined by its independence, size and composition, with boards presumed to be more independent in proportion to the number of outside directors. However, US research on the relationship between board effectiveness and 'independence' has produced inconclusive results according to recent meta-analyses of a number of previous studies of the relationship between board composition and firm performance (Dalton et al., 1998; Wagner et al., 1998). Dalton et al. found no evidence of a relationship between board composition and firm performance. In contrast, Wagner et al.'s analysis of 29 studies found evidence of a curvilinear homogeneity effect in which performance is enhanced by having either a majority of executive directors or a majority of NEDs. This raises issues concerning the conditions under which either a majority of insiders or outsiders is appropriate; as yet research has not adequately addressed these issues. The findings also cast doubt on overly prescriptive views of the efficacy of larger proportions of outsiders on boards.

Tests of the stock market reaction to the appointment of additional NEDs indicate that the market views such events as good news on average (Rosenstein and Wyatt, 1990). However, board size may affect the ability of boards to function effectively. Jensen (1993) argues that boards which are too large may be unable to operate effectively because the co-ordination and process problems outweigh the advantages of having a large number of people to draw on. Yermack (1996) finds a negative relationship between firm performance and board size for a sample of large US companies. Similarly, Eisenberg et al. (1998) found the negative relationship between performance and board size to hold for a large sample of small and medium-sized Finnish companies with smaller board sizes. Conyon and Peck (1998) examined the association between firm performance and board size across a number of European economies and found the effect of board size and corporate performance to be generally negative.

A growing body of US research considers the effect of board structure on the entrepreneurial activities of the firm. In general, the available evidence suggests that a high ratio of outside to inside directors on the board has a negative effect on corporate entrepreneurship. Hill and Snell (1988) and Baysinger et al. (1991) report a positive relationship between the ratio of insider directors and R&D intensity at the individual firm level. Similarly, Zahra (1996) found a negative relationship between the ratio of outsiders on the board and a number of measures of corporate entrepreneurship; for example, innovation, venturing and renewal factors. It should be noted, however, that Jensen (1993) suggests that the return on R&D expenditure may represent a more appropriate measure of investment performance than R&D intensity *per se*, with effective NEDs helping to constrain over-investment in unproductive R&D projects.

Overall, the available evidence produces quite positive results in respect of the role of NEDs in promoting accountability whilst suggesting that NEDs may have adverse implications for the enterprise activities of the firm, with larger boards generally appearing to have a negative effect on performance. However, the largely US-based research is difficult to interpret in the UK context due to the difference in the nature of board structure between the two countries. For example, the finding that increasing proportions of NEDs on the board has a negative effect on corporate enterprise is typically based on samples where the average number and proportions of NEDs is much greater than that in the UK; such a negative relationship may not exist at the lower proportions of NEDs found on UK boards.

In the absence of UK research examining these issues in detail, there are dangers inherent in the recommendations of the UK corporate governance codes. The UK corporate governance codes, by virtue of the fact that they make recommendations regarding board structure, implicitly take the stance that there are forms of governance structure which inherently produce greater efficiency. Moreover, the Combined Code recommendation that there should be a minimum of three NEDs, with NEDs comprising not less than one third of the board, clearly reflects the belief that the inclusion of a certain number of NEDs represents an 'optimal' board structure. Indeed, given that UK boards were in the process of increasing the number of NEDs prior to the Cadbury Report recommendations (see Bank of England, 1988), it might be argued that the presence of NEDs is to some extent endogenous and hence optimal.

However, it is not clear whether companies were recruiting NEDs prior to Cadbury with a view to increasing accountability or in recognition of their strategic input. The evidence reviewed here, and supported by others (e.g., Demsetz and Lehn, 1985) suggests that different governance structures are optimal for different firms. In this case, the recommendations of the Codes, although voluntary, may worsen corporate performance in the long run (Hart, 1995), if companies simply 'box-tick' and add NEDs to the board in order to avoid the costs associated with non-compliance.[2] General recommendations to increase NED representation without taking into account the context of individual firms may have adverse consequences for board performance. The Hampel Report (1998) argues that there are no universally valid answers on issues such as the ideal minimum number of NEDs or the combining of the roles of chair and CEO; as a result, rather than prescribing particular corporate structures and rules, broad principles should be applied flexibly. However, given the prescriptive nature of the Combined Code, it remains to be seen whether companies will diverge from its recommended minimum number of NEDs.

---

[2] The costs of non-compliance include the cost of the time spent by senior members of the board justifying their non-compliance to shareholders (particularly institutions and voting organisations such as PIRC and Manifest). Additional costs include fees paid to NEDs and the possibility that additional

3.1.2. Directors' remuneration

The role of directors' remuneration in providing incentives for directors to promote the long term performance and enterprise activities of the firm is well-documented within the agency theory literature (see, for example, Milgrom and Roberts, 1992). Remuneration packages should enhance directors' incentives with respect to the enterprise activities of the firm, by rewarding them for improved firm performance while reducing their reluctance to take risky actions. Empirical evidence from both the UK and US suggests that the actual link between pay and performance is economically weak, with firm size being the prime determinant of directors' remuneration (see Conyon et al., 1995, for a review). However, Main et al. (1996), who employ a more comprehensive measure of remuneration in exploring the relationship between total board remuneration and company performance, find a significantly greater sensitivity of performance to pay than that observed using narrower measures of pay such as base salary plus bonus.

While in theory performance-related remuneration contracts are adopted by shareholders to reduce conflicts between themselves and directors, in practice, the process of formulating and implementing such contracts is usually under the control of directors themselves. The recommendations of both the Cadbury and Greenbury Committees attempted to place control of remuneration issues in the hands of remuneration committees made up of independent NEDs. However, it is unclear that the adoption of remuneration committees has succeeded in ensuring that the remuneration of executive directors does provide the necessary incentives. The Hampel Report recognises that the use of remuneration surveys by remuneration committees may lead to 'an upward ratchet in remuneration with no corresponding improvement in performance' (para. 4.5). The available evidence suggests that remuneration committees may simply act as a legitimising device to justify increases in remuneration. Ezzamel and Watson (1997, 1998) provide evidence to suggest that executive directors' cash remuneration in the UK is in part based upon external pay comparisons. It is also clear that CEOs are present at remuneration committee meetings that decide their own pay (Conyon, 1997). Kren and Kerr (1997) found the proportion of NEDs on the board of directors had no effect on the relationship between CEO compensation and firm performance. These findings raises serious issues concerning the operation of the board and its committees which are as yet not well-researched (for an exception, see Pettigrew and McNulty, 1995).

Concern has also arisen over the type of performance-related remuneration which is awarded to directors. While executive share options (ESOs) should enhance the link between pay and performance, they seem to have become standard components of remuneration packages, with the maximum allowable ESO holding being awarded automatically (Bruce and Buck, 1997). As a result of concern over the functioning of ESO schemes, the Greenbury Report (1995) recommended the introduction of other long-term incentive plans (L-Tips) which involve the award of shares (rather than options), subject to specific company performance targets being met. However, the performance targets adopted by companies may not be particularly stringent and the complexity of schemes presents difficulties for shareholders attempting to assess their cost (see, for example, Lewis, 1996).

Given that the role of performance-related remuneration has received much attention, there are dangers that the current emphasis on the incentive aspects of remuneration will lead to the risk-bearing aspects of remuneration being ignored. The impact of directors' remuneration on the entrepreneurial activities of the firm has largely been ignored in the empirical literature. However, Beatty and Zajac (1994) found that firm risk was negatively related to the proportion of performance-related compensation in the total compensation package. Moreover, the presence of alternative monitoring devices (specifically in terms of board structure) was greater in firms using a lower proportion of performance-related compensation in the total compensation package. Such findings highlight the dangers inherent in pressurising firms into increasing the amount of performance-related remuneration included in the overall remuneration package without considering their effect on the willingness of directors to take risky actions. While

---

NED positions may come at the expense of inside board members (while the average number of NEDs on UK boards has increased significantly during the 1990s, board size has remained roughly constant, suggesting that additional NEDs have been added while the number of insiders has reduced, Peasnell et al., 1998).

performance-related remuneration provides an alternative to direct, more costly monitoring, the assumption, inherent in agency theory, is that such remuneration packages can be designed, implemented and monitored by shareholders. Given the difficulties which arise in the effective monitoring of the use of remuneration packages, there is a danger that shareholders will insist on the adoption of more visible forms of performance-related remuneration without also ensuring that the remuneration package provides incentives for directors to take risky actions.

3.1.3. Directors' ownership

The influence of directors' ownership in the governance of corporations is relevant to the current debate, particularly given the emphasis placed on the award of shares (in place of share options) as part of directors' remuneration packages by the Greenbury Report. Furthermore, many directors own significant proportions of their company's equity unconnected with their past or present remuneration packages.[3]

The notion that shareholdings by directors helps to align the interests of shareholders and managers is well documented in the agency literature (Jensen and Meckling, 1976). Jensen and Meckling's convergence of interest hypothesis contends that, as managerial ownership in a firm increases, a firm's performance increases uniformly, as managers are less inclined to divert resources away from value maximisation. In contrast, Demsetz (1983) and Fama and Jensen (1983) contend that market discipline will force managers to adhere to value maximisation at very low levels of ownership. Morck et al., (1988) argue that high levels of managerial ownership could lead to 'entrenchment', as external shareholders find it difficult to control the actions of such managers. The combination of the convergence of interest and entrenchment effects point towards a non-linear relationship between firm performance and management ownership. The US empirical literature (Morck et al., 1988; McConnell and Servaes, 1990 and 1995; Kole, 1995) generally suggests that management is aligned at low and possibly high levels of ownership, and is entrenched at intermediate ownership levels, although the ownership levels at which the switch from alignment to entrenchment and vice versa takes place are open to debate.[4] Short and Keasey (1999) found evidence consistent with the hypothesis that a similar relationship exists between firm performance and management ownership for UK firms. In contrast, analysis of management buy-outs in the UK finds a linear relationship between management ownership and performance (Thompson, Wright and Robbie, 1992). However, there is evidence to suggest that managers can become entrenched at very low levels of ownership. The results of Dahya et al. (1998) for the UK suggest that top executives seem to be largely insulated from the discipline of the internal control market when their ownership stakes rise above 1%.

Equity ownership by NEDs may affect their incentive to monitor the performance of executive directors. The Hampel Report noted that 'the payment of part of a non-executive directors' remuneration in shares can be a useful and legitimate way of aligning the directors' interests with those of shareholders' (para. 4.8). Shivdasani (1993) and Jensen (1989) suggest that NEDs who hold a large equity stake in the firm are likely to have a greater incentive to monitor executive directors than those without such a stake. Morck et al., (1988) found the relationship between firm performance and the equity ownership of NEDs to be non-linear, suggesting that NEDs are aligned at low and possibly high levels of ownership, but entrenched at intermediate ownership levels. However, equity ownership by NEDs may have a negative impact on the managerial labour market, since it may make exit from poorly performing firms less feasible, which in turn could serve to reduce the value of NEDs' human capital (Kaplan and Reishaus, 1990).

Empirical work investigating the effect of directors' ownership on corporate entrepreneurship has provided inconclusive results. Wright et al. (1996) suggest that, for firms with growth opportunities, the relationship between insider ownership and corporate risk taking initially increases and then subsequently decreases as insider ownership increases. Gibbs (1993) finds that insiders with large equity stakes have incentives to diversify the activities of the firm in an attempt to diversify their own portfolios. Denis et al. (1997) for the US report a negative relationship between diversification and insider ownership at very low levels of equity ownership, but find a positive effect to dominate at very high levels of insider ownership. In contrast, Hill and Snell (1988) found insider ownership to be negatively correlated with diversifying expansion, while Hoskisson et al. (1995) found a positive relationship to exist between international diversification and insider ownership. Zahra (1996) finds a positive relationship between corporate entrepreneurship and insider ownership.

---

[3] Short and Keasey (1999) report, for a random sample of UK quoted companies in 1992, director's mean ownership was 11.5% of equity (median 4.1%).

[4] Morck et al. (1988) report a positive relationship between performance and management ownership in the 0% to 5% range and beyond the 25% ownership level, and a negative relationship in the 5% to 25% range. In contrast, McConnell and Servaes (1990, 1995) reported a positive relationship between performance and management ownership between 0% and approximately 40-50% ownership, and a negative relationship for ownership above that level. However, Kole (1995) suggests that these different findings are attributable to differences in the size of the firms analysed, and argues that the positive relationship between performance and ownership is sustained at higher levels of ownership for small firms (the McConnell and Servaes sample) than it is for large firms (the Morck et al. sample).

There is also evidence that enterprises that become management buy-outs experience improvements in corporate entrepreneurship as measured by better utilisation of R&D, increases in new ventures and greater new product development (Wright et al., 1992; Zahra, 1995). Hill and Snell (1988, 1989), Kochhar and David (1996), Hansen and Hill (1991) and Hoskisson et al. (1995) found no significant relationship to exist between R&D expenditure and insider ownership. The limited research on the relationship between NED equity ownership and corporate entrepreneurship finds that ownership by NEDs tempered a negative association between the ratio of outsiders on the board and corporate entrepreneurship (Zahra, 1996) and was positively related to international diversification (Hoskisson, et al., 1995).

Overall, evidence from the US suggests that directors' equity ownership plays a significant role in the governance of corporations. In particular, the evidence which generally suggests that low levels of equity ownership help to align the interests of directors' and shareholders provides support for attempts by Greenbury and Hampel to provide remuneration in the form of long-term shareholdings. However, recent evidence that entrenchment can occur at low levels of directors' ownership suggests a need to ensure that other governance mechanisms are in place.

3.2. Institutional shareholders

The Cadbury Report argued that 'the way in which institutional shareholders use their power to influence the standards of corporate governance is of fundamental importance' (para. 6.10). However, institutional shareholders have generally not exercised a significant degree of control over management. Gaved (1997) argues that fund managers have little time or resources to devote to active monitoring beyond that of under-performing stocks in which they are the largest shareholder. Hence, despite concentrated institutional share ownership, managers remain largely unmonitored (Berle, 1959; Sykes, 1994). An additional separation of ownership from control occurs at the shareholder level as the fund managers are often not direct beneficiaries of the increased revenues arising from exercising tighter control over corporate management.

A key issue, then, is the effect of increased monitoring by institutional shareholders on the enterprise potential of UK companies. This issue is related to concerns about the role of institutional investors in generating excessively short-term perspectives, resulting in relatively low levels of R&D expenditure by UK companies, high dividend payments and relatively large volumes of takeover activity, to the detriment of general economic performance (Marsh, 1990; Nickell, 1995).

The mainly US empirical work in this area generally finds that in contrast to the widely held view that institutions act as myopic investors, there is a positive relationship between R&D expenditure and institutional shareholdings (Jarrell and Lehn, 1985; Hansen and Hill, 1991; Baysinger et al., 1991). Different types of institutions may have different effects on the enterprise activities of firms (Bushee, 1998). Kochhar and David (1996) find that more active investors (such as pension funds and mutual funds) are more able to influence managers to increase new product development, even after for controlling for spending on R&D, than are institutions such as banks and insurance companies which are less active. Long-term institutional shareholdings have a significant and positive effect on firm innovation (Zahra, 1996). Ownership by pension funds appears to have a positive effect on R&D intensity and new product intensity, but a negative effect on external innovation, while ownership by investment managers (mutual funds) is positively associated with international diversification and external innovation, where external innovation involves acquisitions to acquire new products, to develop new processes or build new markets (Hoskisson et al., 1995). Bushee (1998) examines the impact of institutional shareholders on R&D expenditure and finds that managers are less likely to cut R&D expenditure to reverse an earnings decline when institutional ownership is high. However, high ownership by institutions that have high portfolio turnover and engage in momentum trading significantly increases the probability that managers reduce R&D expenditure to reverse an earnings decline. Institutional shareholdings are also found to have a positive effect on corporate risk-taking for firms with growth opportunities (Wright et al., 1996).

The problems arising from weaknesses in institutional shareholder monitoring have been argued to be a major driving force behind the taking private of quoted companies through management buy-outs, with the introduction of active monitors in the form of private equity providers and leveraged buy-out associations (Jensen, 1993; Baker and Smith, 1998) as well as more active involvement by debt providers (Citron et al., 1997) accompanying this change in ownership.

In summary, US evidence suggests that certain types of institutional shareholdings can have a positive impact on the enterprise and performance of firms. The exact nature of the effect of institutional involvement would seem, however, not surprisingly, to depend upon both the characteristics of the firm, the institution and the particulars of the specific governance environment. Care is, therefore, needed in general prescriptions concerning the level of institutional shareholder involvement.

3.3. Auditors, auditing and accounting information

The supply of audited accounting information is a crucial aspect of corporate governance, as it bridges the information asymmetry between directors and outside providers of finance and provides a report of directors' stewardship (Whittington, 1993). In order to improve the auditing function, the Cadbury Report recommended that companies should establish audit committees, comprising of NEDs, the majority of which should be independent. Although larger companies generally followed these recommendations (Mills, 1997), there is evidence that executive directors were present on such committees in a significant proportion of cases (Ezzamel and Watson, 1995) and that their functioning was problematical in smaller companies (Collier, 1997).

A number of US studies investigate the relationship between the 'quality' of accounting information and NEDs. Wild (1994, 1996) finds a significant increase in the market's reaction to earnings reports subsequent to the formation of an audit committee and infers that audit committees enhance the quality of the earnings information. Dechow et al. (1996) find that firms found guilty of violations of US GAAP are more likely to have boards of directors dominated by management. Beasley (1996) reports that the proportion of NEDs on the board is lower for firms found guilty of financial statement fraud compared to firms with no reported financial statement fraud and concludes that the inclusion of NEDs increases the board's effectiveness at monitoring management for the prevention of financial statement fraud. Both Dechow et al. (1996) and Beasley (1996) find different results in relation to the impact of audit committees. Dechow et al. find that corporations found guilty of US GAAP violations are less likely to have audit committees, while Beasley finds that the presence of an audit committee has no significant effect on the likelihood of financial statement fraud. However, the 'quality' of accounting information is difficult to quantify, and whilst the above studies conclude that their findings are consistent with the notion that NEDs are successful at monitoring management, alternative hypotheses which are consistent with their findings can be adduced.[5] Moreover, if NEDs have adverse effects on enterprise, shareholders may be content to trade off 'quality' accounting information with improvements in performance.

The Cadbury Committee's recommendations that companies include a report on the effectiveness of internal control systems in their annual reports has been problematical because of the difficulty in defining the scope of the notion of internal control. In contrast to the US approach, which viewed internal control systems as an integrated framework tying both financial and operational control together (Mills, 1997), UK guidance suggested that internal financial controls should embrace issues concerning the materiality and the likelihood of financial risks which may be incurred. Jones et al. (1993) suggest that firms which use only a formalised and mechanistic approach to internal controls may meet reporting requirements, but it is doubtful whether effective corporate governance in terms of the achievement of both accountability and enterprise will be achieved. Similarly, Mills (1997) and Lipworth (1996) argue that it is important for internal control systems to provide for risk assessment and management, not only for accountability purposes but also as a basis for the identification of opportunities for the creation of value.

The trade-off between accountability and enterprise in internal control compliance raises questions concerning the nature of the audit process/product itself. Power (1998, p. 79) argues that once one has moved beyond formal compliance with officially sanctioned due process, one is left with notions of comfort, intuition and personal judgement. This trade-off also raises questions about the independence of auditors and the ethics of their behaviour in a governance context. Independence may be compromised by the increasing ethical challenges facing auditors in their work (Vyakarnam et al., 1996; Goodwin, 1996; Karcher, 1996; Napier, 1998; Power, 1995). Cook et al. (1997) examine the same issue using a game theoretical approach, and conclude that the achievement of a socially desirable outcome of high and honest effort in auditing may necessitate a high degree of co-operation between auditor and client which may question auditor independence (Bazerman et al., 1997; Cook et al., 1997). These issues also raise concerns about the role of accountancy education and training in the formation of attitudes towards professional ethics (for example, Ponemon, 1988; Lee, 1989; Gray et al., 1994; Harwood, 1996).

---

[5] For example, Beasley's sample of firms not found guilty of financial statement fraud may contain both firms not engaged in fraud and firms engaged in fraud but are not found out. If this is the case, the study's findings about the relationship between NEDs and the occurrence of financial statement fraud may need to be treated with caution. His findings may be consistent with the hypothesis that inside directors are more easily able to identify and report financial statement fraud.

Seen in a wider context, the issues of auditor responsibility and independence go to the heart of the business ethics (for example, Chryssides and Kaler, 1996) and corporate governance debates concerning the role and conception of the corporation and its social mandate (for example, Blair, 1995). Until or unless a clearer picture of the nature of the corporation in the UK emerges, the role of the audit remains somewhat ambiguous and the auditors' liability debate cannot be resolved (Power, 1998).

3.4. Market for corporate control

In contrast to the outsider systems of Germany and Japan, the takeover market is seen in the UK and US as a major mechanism for disciplining underperforming management.[6] The market for corporate control and outside directors serve as substitute control mechanisms, in that the former assumes an important role in disciplining management when internal control by the latter becomes ineffective (Jensen, 1986). Furthermore, as Hart (1995) notes, other internal disciplining mechanisms, such as monitoring by large shareholders, are subject to free rider problems in that those incurring monitoring costs do not receive the full gains generated by their actions. Alternatively, the takeover mechanism, in principle, allows the bidding company to reap large gains from its action.

However, the prevalence of hostile takeovers in the UK and US may be a symptom of governance problems rather than an answer to such problems (Shleifer and Summers, 1988; O'Sullivan, 1997). These problems have been argued to include enhancing short-termist pressures (Stein, 1988; Shleifer and Vishny, 1990), furthering bidding managers' objectives rather than disciplining poor managers (Charkham, 1989; Jenkinson and Mayer, 1994), enhancing managers' salaries (Gregg et al., 1993) and the breach of trust between managers and shareholders (Shleifer and Summers, 1988). Kay (1994) argues that long-term, often implicit, relationships with all stakeholders are crucial to the competitive advantage of companies. The continual threat of hostile takeover may mean that implicit contracts between the company and its stakeholders do not develop, which may have an adverse effect on the competitive advantage of UK companies.

These arguments are often associated with suggestions that an important development in corporate governance should be to enact legislation to restrict hostile takeovers. However, it is probably too simplistic to take either of the extreme views that hostile takeovers should be prohibited or should be regarded as the primary tool of corporate governance, since there is evidence to suggest that the threat of takeover and the takeover process itself may yield benefits (Chiplin and Wright, 1987; Markides, 1995; O'Sullivan, 1997). Both US and UK evidence suggests that a hostile takeover bid provides a 'kick in the pants' to target management and the successful defence of a hostile takeover stimulates those managers to undertake considerable restructuring and improve their performance (Bradley et al., 1993; Gibbs, 1993; Firth, 1980; Parkinson and Dobbins, 1993; Limmack, 1994; Franks and Mayer, 1996). Thus, the governance structure may have beneficial consequences for enterprise. However, to the extent that there are weaknesses in governance mechanisms, agency problems will persist, and it should not be surprising if managers continue to engage in acquisitions which are not value maximising. It may be the case that enhancements to other elements of corporate governance, such as extensions to the requirements of bidder shareholders to vote on acquisitions above a certain size and to closer links between performance and executive remuneration, will provoke more value-enhancing acquisitions.

US research suggests that acquisition activity affects the amount of long term investment in innovative activities undertaken by a firm. A series of papers (Hitt et al., 1990; Hitt et al., 1991; Hitt et al., 1996) finds that acquisition activity is associated with less R&D expenditure and reduced internal innovation. Associated changes from an emphasis on strategic control to an emphasis on financial controls also reinforce the shift away from internal innovation. Hence, the UK's reliance on the market for corporate control may have implications for the amount of internal innovation undertaken by UK firms.

3.5. The substitutability/complementarity of governance mechanisms

As the above discussion has indicated, effective governance, in terms of both accountability and enterprise, involves complex interrelated bundles of mechanisms. As yet research (particularly in the UK) into the extent of the linkages and relationships between the various governance mechanisms, is extremely limited. Further research is required into the interdependence (in terms of substitutability and complementarity) of alternative governance mechanisms.

US evidence (Rediker and Seth, 1995) suggests that notions of substitutability and complementarity may mean that empirical studies which seek to examine the effect of a single governance mechanism may be flawed. Essentially, such research typically tests the joint hypothesis that the governance mechanism affects performance, *and* that the mechanism under analysis is independent of other governance mechanisms not included in the equation. If, however, the included explanatory variables are correlated with relevant excluded variables, the coefficients on the included variables may be biased and inconsistent. An examination of the interdependence of corporate governance mechanisms in the US by Agrawal and Knoeber (1996) finds that control mechanisms are chosen optimally except that firms in their sample tended to have too many outside directors. Diacon and O'Sullivan (1995) also provide evidence of the substitutability and complementarity of corporate governance mechanisms in the UK, finding that while formal governance may be effective in limiting executive remuneration it could inhibit profitability. In respect of management buy-outs, there is also evidence of complementarity and substitutability between the corporate governance mechanisms involved. Evidence suggests that the greatest impact on performance emanates from managerial equity stakes but that the presence of significant leverage and active investors is also important (Thompson, Wright and Robbie, 1992; Phan and Hill, 1995; Denis, 1994).

---

[6] Empirical evidence from the US is more supportive of this role of the takeover market, while for the UK, Franks and Mayer (1996) provide evidence that hostile takeovers do not perform a disciplining function.

These arguments have implications for the developing trend in corporate governance policy pronouncements in the UK. In particular, moves to encourage the greater exercise of voice by shareholders and their representatives (Mayer, 1994; Franks and Mayer, 1995) may need to be treated with caution. Insider and outsider systems may be substitutes as each may be appropriate in different contexts (Franks and Mayer, 1995), raising particular issues as far as enterprise is concerned. Enterprise typically involves risk, the extent of which may vary between differing projects. Riskier investments may require closer, active and responsive monitoring if they are to come to fruition. Outsider systems may fail to provide sufficient monitoring. Insider systems may provide monitoring but fail to ensure exit from non-viable projects in a timely fashion. This suggests a need for firm/situation-specific corporate governance in which the actual use of voice varies and where there is sufficient pressure to exit.

More generally, Roe (1997) argues for the existence of competing governance mechanisms *within* a particular economy on the grounds that firms with the more effective system in a given situation would outperform those without it, and put pressure on the other firms to change behaviour.

4. Conclusion

This paper has attempted to analyse developments in corporate governance in the UK in the context of a general corporate governance framework which emphasises the need for governance to address both accountability and enterprise and the interaction between these two aspects of corporate governance. Given its limited remit and its establishment in an environment of a number of well-publicised accountability problems, it is perhaps understandable that the Cadbury Report had little room for explicit consideration of the enterprise aspects of governance. Although the Hampel Report (and indeed the Cadbury Report itself) stressed the need to apply recommendations regarding board structure, etc., flexibly, the relative ease with which companies can comply with the form rather than the spirit of the recommendations, has resulted in a 'box-ticking' mentality. It is unclear whether merely complying with the recommendations will improve accountability. Furthermore, if companies adhere to the *spirit* of the recommendations, given their emphasis on accountability, it is unclear what the effects on the enterprise potential of a company will be.

It has been our contention that hitherto the policy debate and research have focused too much on the accountability aspects of corporate governance to the possible detriment of enterprise. The arguments and evidence reviewed here suggest there is a need to weigh the costs and benefits of efforts to enhance accountability in terms of potential entrepreneurial actions foregone in order to achieve a greater balance in the approach to corporate governance. Specifically, there is a need to recognise that the appropriate balance may vary according to the characteristics of particular firms. The development of policy recommendations on corporate governance over the past five years, as exemplified by the Hampel Report, represent an important departure from the narrow Cadbury view of corporate governance in recognising that, in principle, enterprise should not be sacrificed in the name of accountability.

However, the Hampel Committee's emphasis on the need to focus on the enterprise aspect of corporate governance is based on a paucity of UK evidence. While US evidence suggests that relationships exist between governance mechanisms, enterprise and accountability, it is not clear that US research findings apply directly to the UK. Although the US and UK are typically grouped together as having market-based governance systems (Moerland, 1995), there are a number of significant differences between the two countries, notably with respect to the concentration of institutional ownership, the ability of institutions to operate 'behind the scenes' (Black and Coffee, 1994; Short and Keasey, 1997), the nature of takeover defences (Holl and Kyriazis, 1997), and the balance of insiders and outsiders in board structures.

Given these differences, it is possible that US research findings on the substitutability/complementarity of alternative governance mechanisms and the extent to which they affect the strategy and entrepreneurial activities of companies are not directly applicable to UK companies. If the corporate governance framework in the UK is to develop on the basis of the need to balance accountability and enterprise, there is clearly a need for UK research to guide such development. UK research on *both* the accountability and enterprise aspects of corporate governance is somewhat limited. Furthermore, testing whether various governance mechanisms have a significant effect on accountability or enterprise is fraught with difficulty. Many studies focus on firm performance, measured in terms of accounting or stock market returns, as proxy indicators of whether governance mechanisms improve accountability. However, firm performance represents the *interaction* of accountability and enterprise. Whilst it is recognised that it is often not possible to observe directly whether governance structures influence accountability and enterprise, there are a number of key research questions which UK research could usefully investigate:

I. General corporate governance studies

- *Is there a relationship between board structure and firm performance?*

Whilst there is some evidence from the US that too many NEDs can have adverse consequences for both performance and enterprise, the significant differences between board structures in the US and UK make such findings problematical in the UK context. Given the emphasis on board structure in the UK corporate governance recommendations, this is clearly an area which warrants in-depth investigation. Research in this area might, for example, include measures of CEO and board tenure as well as proportions of insider/outsider directors. Also, it would also appear important to incorporate variables measuring changes in these factors.

- *Is there a relationship between various governance devices and enterprise?*

Does board structure, the presence of institutional investors, insider shareholdings, etc. influence corporate enterprise activities (such as R&D expenditure, risk taking, etc.)? While some enterprise variables may be available from annual reports, others may need to be collected from archival data (stock exchange circulars, press reports) or surveys of directors. Sectoral and other control variables may need to be introduced.

- *Which types of firm might be expected to benefit from an approach to governance which emphasises (a) accountability and (b) enterprise?*

Do firms in high R&D sectors benefit in terms of greater innovation and subsequent performance from having, for example, boards with greater proportions of insider directors? Do firms in mature sectors benefit from having boards with greater proportions of outsider directors?

- *What is the degree of interdependence between the various governance mechanisms, such as board structure, insider shareholdings, institutional shareholdings, separations of chair and CEO, etc.?*

Do governance mechanisms influence firm performance and enterprise and is there a tradeoff between the various mechanisms in respect of their individual effect on performance? Analysis here may need to model actions relating to enterprise and accountability as moderators of changes in performance. Data collection needs to involve both accounting/share price data on performance and questionnaire and/or archival data relating to strategy variables.

- *What is the nature of the links between merger intensive versus non-merger intensive firms and the nature of R&D expenditure and internal innovation?*

Given the role of the market for corporate control as a governance device, there is a need to examine how the use of takeovers impacts on corporate enterprise. Furthermore, studies of the relative importance of internal corporate entrepreneurship versus external acquisition-oriented growth would inform the debate on the relationship between governance and enterprise.

- *To what extent does the operation of the board and internal control mechanisms affect accountability and enterprise?*

Compared to the US, there has also been an absence of attention in the UK to the capabilities of top teams in large corporations and their role in governance and enterprise. Generally missing from both US and the UK literature are detailed analyses of the operation of boards and of internal control mechanisms, investigating how accountability and enterprise issues are explicitly or implicitly balanced in the governance process. There would also appear to be scope for further analysis of the functioning of audit committees in large companies and the appropriate reporting of the effectiveness of internal control systems, particularly in relation to their impact on value creation. This research may require detailed case study analysis and depend on obtaining access to top teams.

- *To what extent does increased emphasis on business ethics affect enterprise?*

Both in the US and the UK, very little research has been conducted in the area of interface between business ethics and corporate governance issues. However, if, as many business ethicists propose, the integrity and commitment of the board rather than compliance is at the root of accountability, empirical research is needed to explore relationships between corporate ethics and enterprise, both at board level and amongst other organisational members. Research in this area might include surveys of board approaches to the trade-offs between ethics and enterprise.

- *What is the nature of the interactions between accountability and enterprise and how do structures and processes of governance exploit these interactions?*

Optimal corporate governance may be achieved through a system of structures and processes in which accountability and enterprise aspects reinforce each other. Research in this area might include case study and quantitative analysis which seeks board members' views on how they explicitly weigh the implications of the need to meet accountability requirements with the impact on enterprise and *vice versa.* For example, to what extent do good internal controls to meet accountability requirements also provide a basis for ensuring that the business' reputation for, say, innovative products is not damaged by poor control mechanisms? As a second example, in the light of existing research on the role of NEDs, to what extent does a balance of expertise exist or can be created among the NEDs on a particular board which contributes to both accountability and enterprise dimensions?

- *What are the costs and benefits of enhancing corporate governance by changing the relationship between risk-bearing and decision-making functions?*

The continued pre-eminence of large, diversely-held companies suggests that the agency costs of the separation ownership and control are generally less than the benefits of separating the risk-bearing and decision-making functions (Jensen, 1993). Further research might usefully examine the changes which occur in companies which exit from quoted markets through public-to-private buy-outs; these transactions have recently been at record levels in the UK (CMBOR, 1999). Existing research on public-to-private buy-outs is primarily US-based and indicates significant performance improvements (see Thompson and Wright, 1995, for a review). However, while there has been considerable emphasis on the benefits to be derived from the reduction of agency costs through the interaction of closer monitoring by active investors, managerial ownership and high leverage, there has been less attention to the potential benefits of these arrangements for increasing entrepreneurial actions by managers that would not have taken place under the previous governance structure (Wright, Dial and Hoskisson, 1998). Whilst we have pointed to some evidence on the enterprise effects of buy-outs, further research is required that systematically examines the relative importance of the agency cost versus enterprise perspectives.

In much of the analysis in this area, care needs to be taken in dealing with potential endogeneity problems in respect of the link between governance variables and outcomes. Attention also needs to be addressed towards the measurement of the impact of efforts to enhance accountability and enterprise. Accounting profits and stock market returns performance variables may include the joint impact of both accountability and enterprise. Approaches might incorporate accountability and enterprise variables, together with interaction terms, in performance equations. There may also be scope for structural equation modelling of the interrelationships between different governance mechanisms, accountability and enterprise variables and performance outcomes.

At a theoretical level, there may also be scope for developing the dominant agency model of the relationship between shareholders and managers to include game-theoretic (e.g. prisoners' dilemma) and procedural justice approaches. Such approaches have been shown to be useful in respect of venture capitalist-entrepreneur monitoring relationships where one party does not have control over decisions (Cable and Shane, 1997; Korsgaard et al., 1995). These perspectives may be especially useful in focusing on enterprise issues in situations where, although shareholders are principals, they may not be in a position to control the nature and level of governance over management, who possess the intimate inside information on the operation of the business.

II. Studies relating to UK corporate governance codes

- *What are the costs and benefits of compliance with the Cadbury and Greenbury recommendations?*

The 'regulatory burden' of complying with the Codes was cited by Hampel as the motivation behind its attempt to substitute principles for details. However, the size and significance of the costs of compliance are unclear, as are the net benefits to be derived from compliance. Key issues here relate to the operationalisation of costs and benefits. One approach may be to use attitudinal surveys of directors and institutional shareholders, although there may be difficulties in matching responses between these two parties in respect of individual enterprises for reasons of confidentiality.

- *Has the 'quality' of financial reporting improved as a result of the Cadbury recommendations?*

Do the presence of NEDs and the formation of audit committees improve the quality of financial information? Moreover, are NEDs and audit committees able to effectively monitor and control the validity of the financial information produced by the finance director? This research might, for example, be approached by examining market reactions to earnings reports subsequent to the formation of an audit committee. However, given the general introduction of audit committees following Cadbury, such analysis might need, for example, to take into account the timing of their introduction and their composition (i.e. balance of insiders and outsiders).

- *Have the Greenbury recommendations led to an improvement in the relationship between performance and pay, and is it economically meaningful?*

It has been suggested that the Greenbury disclosures have led to a general increase in directors' remuneration. An important issue to investigate is whether any improvements in the relationship between performance and pay is simply due to the addition of larger amounts of performance-related pay (in the form of options, shares, bonuses, etc.) on top of high fixed salaries. Empirical analysis may be restricted by the level of disclosure in company accounts and the availability of information from share registers.

In the absence of rigorous UK-based empirical evidence which enhances our understanding of the trade-off between enterprise and accountability, the force of the Hampel Committee's recommendations may be seriously undermined. The danger remains that the provisions of the Combined Code will be applied in a prescriptive manner. Ironically, it is possible that, if the code provisions are not applied in a prescriptive manner, the public and government view may be that self-regulation has not worked, and legislation will be forthcoming as part of the review of company law (DTI, 1998).

The important broadening out of the governance debate beyond the narrow Cadbury perspective may be (mis)construed as a reaction to pressure from industrialists to reduce the regulatory burden on companies. However, it has been argued here that there is a need for the governance debate to be moved forward by the development of a research programme expressly concerned with the relationships between corporate governance, accountability and enterprise. The paper has identified directions for future research which might usefully examine this interaction.

References

Agrawal, A. and Knoeber, C. R. (1996). 'Firm performance and mechanisms to control agency problems between managers and shareholders'. *Journal of Financial and Quantitative Analysis*, 31 (3): 377–397.

Baker, G. and Smith, G. (1998). *The New Financial Capitalists*. Cambridge: CUP.

Bank of England (1988). 'The composition of company boards'. *Bank of England Quarterly Bulletin*, May: 242–245.

Baysinger, B. D. and Butler, H. N. (1985). 'Corporate governance and the board of directors: performance effects of changes in board composition'. *Journal of Law, Economics and Organisation*, 1: 101–124.

Baysinger, B. D. and Hoskisson, R. (1990). 'The composition of boards of directors and strategic control: effects on corporate strategy'. *Academy of Management Review*, 15: 72–87.

Baysinger, B. D., Kosnik, R. D. and Turk, T. A. (1991). 'Effects of board and ownership structure on corporate R&D strategy'. *Academy of Management Journal*, 34 (1): 205–214.

Bazerman, M. H., Morgan, K. P. and Loewenstein, G. F. (1997). 'The impossibility of auditor independence'. *Sloan Management Review*, 37 (4): 89.

Beasley, M. S. (1996). 'An empirical analysis of the relation between the board of director composition and financial statement fraud'. *Accounting Review*, 71 (4): 443–465.

Beatty, R. P. and Zajac, E. J. (1994). 'Managerial incentives, monitoring and risk bearing: a study of executive compensation, ownership and board structure in initial public offerings'. *Administrative Science Quarterly*, 39: 313–335.

Berle, A. and Means, G. (1932). *The Modern Corporation and Private Property*. New York: MacMillan.

Berle, A. (1959). *Power without Property: A New Development in American Political Economy*. New York: Harcourt Brace and World.

Black, B. S. and Coffee, J. C. (1994). 'Hail Britannia?: institutional investor behaviour under limited regulation'. *Michigan Law Review*, 91 (7): 1,997–2,087.

Blair, M. M. (1995). *Ownership and Control*. The Brookings Institution, Washington, D.C.

Bradley, M., Desai, A. and Kim, E. H. (1983). 'The rationale behind interfirm tender offers: information or synergy'. *Journal of Financial Economics*, 11: 183–206.

Brickley, J., Coles, J. and Terry, R. (1994). 'Outside directors and the adoption of poison pills'. *Journal of Financial Economics*, 35: 371–332.

Bruce, A. and Buck, T. (1997). 'Executive reward and corporate governance', in Keasey, K., Thompson, S. and Wright, M. (eds.). *Corporate Governance: Economic and Financial Issues*. Oxford University Press, pp. 80–102.

Bushee, B. J. (1998). 'The influence of institutional investors on myopic R&D investment behavior'. *The Accounting Review*, 73: 305–333.

Byrd, J. and Hickman, K. (1992). 'Do outside directors monitor management? Evidence from tender offer bids'. *Journal of Financial Economics*, 32: 195–222.

Cable, D. and Shane, S. (1997). 'A prisoner's dilemma approach to entrepreneur-venture capitalist relationships'. *Academy of Management Review*, 22: 142–176.

Cadbury, A. (1992). *Report of the Committee on the Financial Aspects of Corporate Governance*. London: Gee Publishing.

Charkham, J. P. (1989). *Corporate Governance and the Market for Control of Companies*. Bank of England Panel Paper, 25.

Chiplin, B. and Wright, M. (1987). *The Logic of Mergers: the Market for Corporate Control in Theory and Practice*. IEA Hobart Paper 107. London: IEA.

Chryssides, G. and Kaler, J. (1996). *Essentials of Business Ethics*. London: McGraw-Hill.

Citron, D., Robbie, K. and Wright, M. (1997). 'Loan covenants and relationship banking in MBOs'. *Accounting and Business Research*, 27 (4): 277–296.

CMBOR (1999). 'Private-to-public buy-outs'. *Management Buy-outs Quarterly Review*. Centre for Management Buy-out

Research. University of Nottingham Business School, Winter 1998/99.

Collier, P. (1997). 'Audit committees in smaller listed companies' in Keasey, K. and Wright, M. (eds.). *Corporate Governance: Responsibilities, Risks and Remuneration*: 91–119.

Committee on Corporate Governance (1998). *The Combined Code*, London Stock Exchange Limited. London: Gee Publishing Ltd.

Conyon, M. J. (1997). 'Institutional arrangements for setting directors' compensation in UK companies' in Keasey, K., Thompson, S. and Wright, M. (eds.). *Corporate Governance: Economic and Financial Issues*. Oxford University Press: 103–121.

Conyon, M. J., Gregg, P. and Machin, S. (1995). 'Taking care of business: executive compensation in the United Kingdom'. *Economic Journal*, 105: 704–714.

Conyon, M. J. and Peck, S. (1998). 'Board size and corporate performance: evidence from European countries'. *The European Journal of Finance*, 4: 291–304.

Cook, J., Hatherly, D., Nadeau, L. and Thomas, L. C. (1997). 'Does cooperation in auditing matter? A comparison of a non-cooperative and a cooperative game model of auditing'. *European Journal of Operational Research*, 103 (3): 470–482.

Dahya, J., Lonie, A. and Power, D. (1998). 'Ownership structure, firm performance and top executive change: an analysis of UK firms'. *Journal of Business Finance and Accounting*, 25: 1,089–1,118.

Dalton, D. R., Daily, C. M., Ellstrand, A. E. and Johnson, J. L. (1998). 'Meta-analytic reviews of board composition, leadership structure and financial performance'. *Strategic Management Journal*, 19: 269–290.

Davis, E. and Kay, J. (1993). 'Corporate governance, takeovers and the role of the non-executive director', in Bishop, M. and Kay, J. *European Mergers and Merger Policy*. Oxford: Oxford University Press.

Dechow, P. M., Sloan, R. G. and Sweeney, A. P. (1996). 'Causes and consequences of earnings manipulation: an analysis of firms subject to enforcement actions by the SEC'. *Contemporary Accounting Research*, 13 (1): 1–13.

Demsetz, H. (1983). 'The structure of ownership and the theory of the firm'. *Journal of Law and Economics*, 26: 375–390.

Demsetz, H. and Lehn, K. (1985). 'The structure of corporate ownership: causes and consequences'. *Journal of Political Economy*, 93: 1,155–1,177.

Denis, D. J. (1994). 'Organizational form and the consequences of highly leveraged transactions: Kroger's recapitalization and Safeway's LBO'. *Journal of Financial Economics*, 36: 193–224.

Denis, D. J., Denis, D. K. and Sarin, A. (1997). 'Agency problems, equity ownership and corporate diversification'. *Journal of Finance*, 52 (1): 135–160.

Diacon, S. and O'Sullivan, N. (1996). 'Does corporate governance influence performance?' Some evidence from UK insurance companies'. *International Review of Law and Economics*, 15: 405–424.

DTI (1998). *Modern Company for a Competitive Economy*. London: Department of Trade and Industry.

Eisenberg, T., Sundgren, S. and Wells, M. T. (1998). 'Larger board size and decreasing firm value in small firms'. *Journal of Financial Economists*, 48: 35–54.

Ezzamel, M. and Watson, R. (1995). *Corporate Governance and Managerial Remuneration*. London: ICAEW.

Ezzamel, M. and Watson, R. (1997). 'Wearing two hats: the conflicting control and management roles of non-executive directors' in Keasey, K., Thompson, S. and Wright, M. (eds.). *Corporate Governance: Economic and Financial Issues*. Oxford University Press: 54–79.

Ezzamel, M. and Watson, R. (1998). 'Market comparison earnings and the bidding-up of executive cash compensation: evidence from the United Kingdom'. *Academy of Management Journal*, 41 (2): 221–231.

Fama, E. F. (1980). 'Agency problems and the theory of the Firm'. *Journal of Political Economy*, 88 (21): 288–307.

Fama, E. F. and Jensen, M. C. (1983). 'Separation of ownership and control'. *Journal of Law and Economics*, 26: 301–325.

Firth, M. (1980). 'Takeovers, shareholder returns and the Theory of the Firm'. *Quarterly Journal of Economics*, 94: 235–260.

Franks, J. R. and Mayer, C. (1995). 'Ownership and control'. Paper presented at the Institute of Directors Conference, *Enterprise and Governance*, 24 October 1995.

Franks, J. and Mayere, C. (1996). 'Hostile takeovers and the correction of managerial failure'. *Journal of Financial Economics*, 40: 163–181.

Gaved, M. (1997). *Closing the Communication Gap: Disclosure and Institutional Shareholders*. London: ICAEW.

Gibbs, P. (1993). 'Determinants of corporate restructuring: the relative impact of corporate governance, takeover threat and free cash flow'. *Strategic Management Journal*, 14 (Supplement): 51–68.

Goodwin, B. (1996). 'Ethics and responsibility in a large accountancy firm'. Working Paper, Henley Management College.

Gray, R., Bebbington, J. and McPhail, K. (1994). 'Teaching ethics in accounting and the ethics of accounting teaching: educating for immorality and a possible case for social and environmental accounting education'. *Accounting Education*, 3 (1): 51–74.

Greenbury, R. (1995). *Directors' Remuneration: Report of a Study Group Chaired by Sir Richard Greenbury*. London: Gee Publishing Ltd.

Gregg, P., Machin, S. and Syzmanski, S. (1993). 'The disappearing relationship between directors' pay and corporate performance'. *British Journal of Industrial Relations*, 31: 1–9.

Hampel, R. (1997). *Committee on Corporate Governance: Preliminary Report*. Committee on Corporate Governance.

Hampel, R. (1998). *Committee on Corporate Governance: Final Report*. London: Gee Publishing.

Hansen, G. S. and Hill, C. W. L. (1991). 'Are institutional investors myopic? A time-series study of four technology-driven industries'. *Strategic Management*, 12: 1–16.

Hart, O. (1995). 'Corporate governance: some theory and implications'. *Economic Journal*, 105: 678–689.

Harwood, R. (1996). 'Ethical training'. *Accountancy*, August: 118.

Hill, C. W. L. and Snell, S. A. (1988). 'External control, corporate strategy and firm performance in research intensive industries'. *Strategic Management Journal*, 9: 579–590.

Hill, C. W. L. and Snell, S. A. (1989). 'Effects of ownership structure and control on corporate productivity'. *Academy of Management Journal*, 32: 25–46.

Hitt, M. A., Hoskisson, R. E. and Ireland, R. D. (1990). 'Mergers and acquisitions and managerial commitment to innovation in M-Form firms'. *Strategic Management Journal*, 11: 29–47.

Hitt, M. A., Hoskisson, R. E., Ireland, R. D. and Harrison, J. S. (1991). 'Effects of acquisitions on R&D inputs and outputs'. *Academy of Management Journal*, 34 (3): 693–706.

Hitt, M. A., Hoskisson, R. E., Johnson, R. A. and Moesel, D. D. (1996). 'The market for corporate control and firm innovation'. *Academy of Management Journal*, 39 (5): 1,084–1,119.

Holl, P. and Hyriazis, D. (1997). 'Agency, bid resistance and the market for corporate control'. *Journal of Business Finance and Accounting*, 24 (7/8): 1,037–1,066.

Hoskisson, R., Hitt, M., Johnson, R. and Grossman, W. (1995). 'The effects of internal governance and ownership control on corporate entrepreneurship'. University of Texas A&M, mimeo.

Hughes, A. (1993). 'Mergers and economic performance in the UK: a survey of the empirical evidence 1950–1990', in Bishop, M. and Kay, J. (eds.). *European Mergers and Merger Policy*, Oxford University Press: 9–95.

Jarrell, G. A. and Lehn, H. (1985). *Institutional Ownership, Tender Offers, and Long-Term Investments*. Washington, D.C., Office of the Chief Economist, Exchange Commission.

Jenkinson, T. and Mayer, C. (1994). *Hostile Takeovers: Defence, Attack and Corporate Governance*. London: McGraw-Hill.

Jensen, M. C. (1986). 'Agency costs of free cash flow, corporate finance and takeovers'. *AEA Papers and Proceedings*, 76 (2): 323–329.

Jensen, M. C. (1989). 'Eclipse of the Public Corporation', *Harvard Business Review* (Sept/Oct): 61–74.

Jensen, M. C. (1993). 'The modern industrial revolution, exit, and the failure of internal control systems'. *Journal of Finance*, 48: 831–880.

Jensen, M. C. and Meckling, W. H. (1976). 'Theory of the firm: managerial behaviour, agency costs and ownership structure'. *Journal of Financial Economics*, 4: 305–360.

John, K. and Senbet, L. W. (1998). 'Corporate governance and board effectiveness'. *Journal of Banking and Finance*, 22: 371–403.

Jones, S., Rickwood, C. and Greenfield, S. (1993). *Accounting Control and Management Philosophies*. Research Board. London: ICAEW.

Karcher, J. N. (1996). 'Auditors' ability to discern the presence of ethical problems'. *Journal of Business Ethics*, 15 (10): 1,033–1,050.

Kaplan, S. and Reishus, D. (1990). 'Outside directors and corporate performance'. *Journal of Financial Economics*, 27: 389–410.

Kay, J. (1994). 'Corporate strategy and corporate accountability' in Dinsdale, N. and Prevezer, M., *Capital Markets and Corporate Governance*. Oxford: Clarendon Press: 50–65.

Kay, J. and Silbertson, A. (1995). 'Corporate governance'. *National Institute Review*, August: 84–97.

Keasey, K. and Wright, M. (1993). 'Corporate governance: issues and concerns'. *Accounting and Business Research*, 23 (91A): 301–313.

Kochhar, R. and David, P. (1996). 'Institutional investors and firm innovation: a test of competing hypotheses'. *Strategic Management Journal*, 17: 73–84.

Kole, S. R. (1995). 'Measuring managerial equity ownership: a comparison of sources of ownership data'. *Journal of Corporate Finance*, 1: 413–435.

Korsgaard, M., Schweiger, D. and Sapienza, H. (1995). 'The role of procedural justice in building commitment, attachment and trust in strategic decision-making teams'. *Academy of Management Journal*, 38: 60–84.

Kren, L. and Kerr, J. L. (1997). 'The effects of outside directors and board shareholdings on the relation between chief executive compensation and firm performance'. *Accounting and Business Research*, 27 (4): 297–309.

Lee, T. (1989). 'Education practice and research in accounting: gaps, closed loops, bridges and magic accounting'. *Accounting and Business Research*, 19 (75): 237–253.

Lewis, W. (1996). 'Directors' tips too generous for investors'. *Financial Times*, 6 August, p. 6.

Limmack, R. J. (1994). 'Synergy or new information as a source of wealth changes in acquisitions: the case of abandoned bids'. *Accounting and Business Research*, 24: 255–265.

Lipworth, S. (1996). 'Keynote address: corporate governance' in Carey, A. and Sancto, J. (eds.). *Corporate Governance: Developing a Charter for Success*. London: ICAEW.

Main, B. G. M., Bruce, A. and Buck, T. (1996). 'Total board remuneration and company performance'. *Economic Journal*, 106: 1,627–1,644.

Markides, C. (1995). 'Diversification, restructuring and economic performance'. *Strategic Management Journal*, 16 (2): 101–118.

Marsh, P. R. (1990). *Short-Termism on Trial*. Institutional Fund Managers Association, London.

Marshall, A. (1920). *Industry and Trade*. London: MacMillan.

Mayer, C. (1994). 'Stock markets, financial institutions and corporate performance' in Dinsdale, N. and Prevezer, M. *Capital Markets and Corporate Governance*. Oxford: Clarendon Press: 179–194.

McConnell, J. J. and Servaes, H. (1990). 'Additional evidence on equity ownership and corporate value'. *Journal of Financial Economics*, 27: 595–612.

McConnell, J. J. and Servaes, H. (1995). 'Equity ownership and the two faces of debt'. *Journal of Financial Economics*, 39: 131–157.

Milgrom, P. and Roberts, J. (1992). *Economics, Organisation and Management*. London: Prentice Hall.

Mills, R. (1997). 'Internal control practices within large UK companies' in Keasey, K. and Wright, M. (eds.). *Corporate Governance: Responsibilities, Risks and Remuneration*. Chichester: Wiley: 121–143.

Moerland, P. (1995). 'Alternative disciplinary mechanisms in different corporate systems'. *Journal of Economic Behavior and Organization*, 26: 17–34.

Morck, R., Shleifer, A. and Vishny, R. W. (1988). 'Managerial ownership and market valuation: an empirical analysis'. *Journal of Financial Economics*, 20: 292–315.

Napier, C. J. (1998). 'Intersections of law and accountancy: unlimited auditor liability in the United Kingdom'. *Accounting, Organisations and Society*, 23 (1): 105–128.

Nickell, S. J. (1995). *The Performance of Companies: The Relationship Between the External Environment, Management Strategies and Corporate Performance*. Oxford: Blackwell.

O'Sullivan, P. (1997). 'Governance by exit: an analysis of the market for corporate control' in Keasey, K., Wright, M. and Thompson, S. (eds.). *Corporate Governance: Economic and Financial Issues*, Oxford University Press: 122–146.

Parkinson, C. and Dobbins, R. (1993). 'Returns to shareholders in successfully defended takeover bids: UK evidence 1975–1984'. *Journal of Business Finance and Accounting*, 20 (4): 501–520.

Peasnell, K. V., Pope, P. F. and Young, S. (1998). 'A new model board'. *Accountancy*, July: 115.

Pettigrew, A. and McNulty, T. (1995). 'Power and influence in and around the boardroom'. *Human Relations*, 48: 845–73.

Phan, P. and Hill, C. (1995). 'Organisational restructuring and economic performance in leveraged buy-outs: an ex post study'. *Academy of Management Journal*, 38 (3): 704–739.

Ponemon, L. A. (1988). 'Cognitive-developmental approach to the analysis of certified public accountants' ethical judgements'. Unpublished PhD dissertation.

Power, M. K. (1995). 'Truth—and the search for profit'. *Financial Times*, 30 March, p. 5.

Power, M. K. (1998). 'Auditor liability in context'. *Accounting, Organizations and Society*, 23 (1): 77–79.

Rediker, K. and Seth, A. (1995). 'Board of directors and substitution effects of alternative governance mechanisms'. *Strategic Management Journal*, 16: 85–99.

Roe, M. (1997). 'The political roots of American corporate finance'. *Journal of Applied Corporate Finance*, 9 (4): 8–22.

Rosenstein, S. and Wyatt, J. G. (1990). 'Outside directors, board independence and shareholder wealth'. *Journal of Financial Economics*, 26: 175–191.

Shivdasani, A. (1993). 'Board composition, ownership structure and hostile takeovers'. *Journal of Accounting and Economics*, 16: 167–198.

Shleifer, A. and Summers, L. H. (1988). 'Breach of trust in hostile takeovers' in Auerbach, A. J. (ed.). *Corporate Takeovers: Causes and Consequences*, National Bureau of Economic Research, Chicago.

Shleifer, A. and Vishny, R. W. (1990). 'Equilibrium short horizons of investors and firms'. *Amercian Economic Review*, 80 (2): 148–153.

Shleifer, A. and Vishny, R. W. (1997). 'A survey of corporate governance'. *Journal of Finance*, 52: 737–783.

Short, H. and Keasey, K. (1997). 'Institutional shareholders and corporate governance in the United Kingdom' in Keasey, K., Thompson, S. and Wright, M. (eds.). *Corporate Governance: Economic and Financial Issues*, Oxford University Press: 18–53.

Short, H. and Keasey, K. (1999). 'Managerial ownership and the performance of firms: evidence from the UK'. *Journal of Corporate Finance*, 5: 79–101.

Smith, A. (1776). *An Inquiry into the Nature and Causes of Wealth of Nations* (repr. New York Random House, 1937).

Stein, J. C. (1988). 'Takeover treats and managerial myopia'. *Journal of Political Economy*, 96: 61–80.

Sykes, A. (1994). 'Proposals for internally competitive corporate governance in Britain and America'. *Corporate Governance: An International Review*, 2 (4): 187–195.

Thompson, S., Wright, M. and Robbie, K. (1992). 'Management equity ownership, debt and performance: some evidence from UK management buy-outs'. *Scottish Journal of Political Economy*, 39 (4): 413–430.

Thompson, S. and Wright, M. (1995). 'Corporate governance: the role of restructuring transactions'. *Economic Journal*, 105 (430): 690–703.

Tricker, R. I. (1984). *Corporate Governance*. Vermont: Gower.

Vyakarnam, S., Strikanthan, S. and Fitzsimmons, S. (1996). 'Can accountants distinguish their assets from their morals?' *Business Ethics: A European Review*, 5 (3): 156–163.

Wagner, J. A., Stimpert, J. L. and Fubara, E. I. (1998). 'Board composition and organizational performance: two studies of insider/outsider effects'. *Journal of Management Studies*, 35 (5): 655–677.

Weisbach, M. (1988). 'Outside directors and CEO turnover'. *Journal of Financial Economics*, 20: 413–460.

Whittington, G. (1993). 'Corporate governance and the regulation of financial reporting', *Accounting and Business Research*, 23 (91A): 311–319.

Wild, J. J. (1994). 'Managerial accountability to shareholders: audit committees and the explanatory power of earnings for returns'. *British Accounting Review*, 26: 353–374.

Wild, J. J. (1996). 'The audit committee and earnings quality'. *Journal of Accounting, Auditing and Finance*, 11 (2): 247–276.

Wright, M., Thompson, S. and Robbie, K. (1992). 'Venture capital and management-led leveraged buy-outs'. *Journal of Business Venturing*, 7 (1): 47–72.

Wright, M., Dial, J. and Hoskisson, R. (1998). 'The entrepreneurship versus agency cost perspectives on leveraged buyouts'. *Academy of Management Best Paper Proceedings*, San Diego, August 8–10.

Wright, P., Ferris, S. P., Sarin, A. and Awasthi, V. (1996). 'Impact of corporate insider, blockholder and institutional ownership on firm risk taking'. *Academy of Management Journal*, 39 (2): 441–463.

Yermack, D. (1996). 'Higher market valuation of companies with a small board of directors'. *Journal of Financial Economics*, 40: 185–211.

Zahra, S. A. (1995). 'Corporate entrepreneurship and financial performance: the case of management leveraged buy-outs'. *Journal of Business Venturing*, 10 (3): 225–247.

Zahra, S. (1996). 'Governance, ownership and corporate entrepreneurship: the moderating impact of industry technological opportunities'. *Academy of Management Journal*, 39 (6): 1,713–1,735.

Book Reviews

The new financial capitalists: Kohlberg, Kravis and Roberts and the creation of corporate value. *George P. Baker and George David Smith.* Cambridge University Press, Cambridge, 1998, ix + 257pp.

Some years ago I watched as Henry Kravis made a presentation on the role of leveraged buy-outs in getting rid of wasteful expenditure by corporate managers. The irony that this presentation should take place in the splendour of the Hotel Majestique in Cannes seemed to be lost on the assembled audience of CEOs from some of the world's major enterprises. Kohlberg, Kravis and Roberts (KKR) have been financing buy-outs since 1976 and have developed a formidable reputation in creating value in under-performing enterprises, both through cutting unnecessary costs and by extensive corporate restructuring. However, the activities of buy-out specialists such as KKR have generated considerable political debate, especially in the US. This volume represents an attempt to show that much of this opprobrium is misplaced.

The role of buy-outs in the context of the development of corporate control is reviewed in Chapter 1; buy-outs being identified as a crucial feature of the fourth merger wave seen in the 1980s. The authors make the important point that it is rather superficial to view leveraged buy-out (LBO) associations such as KKR as marking a return to the type of financial capitalism seen at the beginning of the 20th century. LBO associations represent a novel organisational form in which constituent companies are organised and funded by a separate investment partnership, each of which remains independent of the other companies' operations. The expected benefits from this arrangement derive from the introduction of governance and incentive mechanisms absent from quoted Anglo-American enterprises, that is significant managerial equity ownership, significant levels of debt and the involvement of active investors.

The development of KKR from its early bootstrap deals through its pioneering work in breaking through immense legal complexities with the completion of the Houdaille buy-out, and from small friendly deals to large, more hostile transactions is traced in Chapter 2. The role of KKR in creating value in owner-managed companies is covered in Chapter 3—partnership with management being portrayed as a key aspect of KKR's involvement.

Chapter 4 provides a fairly frank assessment of KKR's problem cases. In particular, the authors shed new light on the RJR-Nabisco deal, previously portrayed in a rather notorious manner in the book and film 'Barbarians at the Gate' (Burrough and Helyer, 1990). The more sober analysis provided here of the problems that subsequently beset RJR-Nabisco suggests that the issues were more complex than the simplistic view that KKR had overpaid and over-leveraged the deal. Although disposals, cost reductions and operating profit increases were achieved initially, progress was adversely affected by the collapse of the junk bond market and the impact of a reduced credit rating on interest rates. These difficulties were further exacerbated by a price war in the tobacco industry and growing political and social opposition to tobacco consumption. In these circumstances, in the authors' judgement, KKR did all they could to turn the situation round, eventually effecting an ingenious realisation of their investment. However, beyond noting that the problem is not in the technique of buy-outs but in its application, the authors offer little analysis of the factors that drove the buy-out market to the excesses of the late 1980s. This is a highly pertinent issue in the buoyant buy-out market environment of the late 1990s, as excessive pricing and leverage reappeared. It raises general questions about the nature of the incentives for buy-out financiers and their fundamental understanding of the businesses in which they invest.

There is extensive evidence of the positive effects of buy-outs in the enterprises concerned, but there has been relatively little systematic research on the functioning of LBO associations as a new institutional form. Chapter 5 contrasts the operation of KKR with that of a traditional corporate headquarters. The authors are sceptical, however, of attempts to liken the LBO association to the Japanese keiretsu. One might add, as Gilson and Roe (1993) have already pointed out, that the stereotypical conditions in which LBO associations have been active are precisely the opposite of the conditions critical to the success of the keiretsu. In terms of the behavioural features of KKR, the importance placed on team building within a flat organisational structure, the maintenance of a relatively small number of 'deal doers' and the emphasis on ethical behaviour are shown to be key to the firm's distinctive approach to buy-outs.

Management buy-outs have existed in some form since at least the Industrial Revolution but until the early 1980s they were a rather obscure and marginal part of the market for corporate control (Wright et al., 1999). Thanks to the efforts of KKR and similar organisations, little short of a revolution has occurred over the past two decades, which have seen buy-outs become part of the mainstream (Chapter 6). Two decades after its own creation, KKR had entered Europe with its investment in Newsquest and in 1998 led the buy-out of Willis Corroon, the largest deal of the year (CMBOR, 1998). In a statement displaying breathtaking parochialism, the authors claim that with the Newsquest deal the British were beginning to follow the Americans in undertaking management buy-outs. In fact, in every year since 1985 published figures show that there have been more buy-outs in the UK than in the US, and there has been a strong presence of US players in the UK market since at least that time. Buy-outs have also become a global phenomenon spreading to Europe, both East and West, and now making their appearance in Japan as that country's enterprises face the major task of restructuring their activities.

The authors identify four main lessons from their study. First, financial structure matters to corporate value creation. Second, value creation is a long-term pursuit that requires hard work and constant vigilance. Third, aligning managerial and ownership interests leads to good results. Fourth, flexibility in financing and adaptability to unforeseen events are crucial determinants of success.

Tellingly, the authors conclude that to achieve long term success it is not just leverage that is needed but also strong managerial talent, well-structured incentives and active board monitoring. In the light of experience over the last two decades, it has to be emphasised that not all companies are good subjects for high leverage, something that does not appear to have been appreciated by many practitioners.

However, the buy-out concept is not limited to the use of high leverage to restructure firms in mature sectors with stable cash flow and low investment needs. Rather, in the 1990s buy-out financiers have had to seek innovative ways to sustain business vitality, with more entrepreneurial approaches such as growth and added value being emphasised to a greater extent than more traditional cost rationalisation. For KKR this has particularly involved investments in banking and insurance, where there were opportunities to restructure under-managed assets; and leveraged build-ups in publishing, where there are opportunities to grow businesses through acquisitions. Whether the claims by some market participants about their ability to generate significant added value will be realised remains to be seen. Question marks are especially raised about the trend towards investor-led buy-outs (IBOs) driven by private equity providers but who face asymmetric information problems, and about leveraged build-ups where the prospective gains may depend heavily on the ability to arbitrage between the price at which a private company is acquired, and the price at which the larger group which is created is subsequently realised.

Overall, this volume provides an interesting, insightful and well-written analysis of probably the most influential buy-out firm. Although having its origins as a commissioned piece of work, the book can rightly be said to achieve its stated aim of providing a more serious financial history to counterbalance some of the more lurid portrayals of the activities of KKR. The authors can claim with some justification that the legacy of buy-out specialists is to have breathed new life into the moribund system of financial capitalism.

Mike Wright
University of Nottingham Business School

References

Burrough, B. and Helyer, J. (1990). *Barbarians at the Gate.* New York: Harper and Row.

CMBOR (1999). 'Management buy-outs'. *Quarterly Review.* CMBOR, University of Nottingham, Spring.

Gilson, R. and Roe, M. (1993). 'Understanding the Japanese kieretsu: overlaps between corporate governance and industrial organizations'. *Yale Law Journal,* 102: 871–906.

Wright, M., Robbie, K., Chiplin, B. and Albrighton, M. (1999). 'The development of an organisational innovation: management buy-outs in the UK, 1980–1997'. *Business History,* forthcoming.

Disclosure of profit forecasts during takeovers: evidence from directors and advisors. *Niamh Brennan.* Institute of Chartered Accountants of Scotland, 1998. v + 103pp.

This study is drawn from the author's PhD thesis. It reports the results of 11 interviews, conducted in 1993 and 1994, with a variety of participants in the takeover market, including directors of bidding and target companies (covering both friendly and contested bids), advisors and regulators, designed to establish why some companies volunteer profit forecasts as part of their offer or defence documents while others do not. In view of the range of participants interviewed, it might be thought that the number of interviews is rather small, but the researcher claims that 'a point of saturation [was] reached, whereby no additional details were coming out of the interview' (p. 4).

Given that companies almost never disclose profit forecasts as a matter of routine, the study hypothesises that there must be compelling reasons for disclosure during a takeover, and that the reasons will differ according to whether the takeover is friendly or contested. The interviews indicate that two closely-related factors are of particular importance in influencing the disclosure decision: whether the forecast is out of line with what the company believes the market is expecting, and whether the forecast gives 'good' or 'bad' news. Companies will disclose forecasts to 'correct' misguided market expectations and are more likely to disclose good news, though they may disclose bad news, for example to underpin an agreed bid at what looks on the surface like an inadequate price. Other relevant factors are the views of advisors, profit variability through time (which influences whether market expectations are likely to be in line with company forecasts without disclosure), and the degree of uncertainty attaching to the forecast (the less confident the company is in the forecast, the less likely it is to be disclosed because of the risk to the directors if it turns out to be unreliable).

Bidding companies disclose forecasts to support share prices during the bid. Targets of friendly bids do so to support the arguments for accepting the bid or because the bidder insists on disclosure as a way of obtaining a formally validated forecast. Targets of contested bids disclose forecasts to raise the offer price or to defeat the bid. There was general agreement that disclosure by targets of contested bids was not usually an effective defence weapon and it was rarely used. Where circumstances were right, however, disclosure could be effective in raising the price, but there was only one mention of success in defeating a bid.

The study concludes with a number of recommendations. Disclosure of profit forecasts should not be made mandatory, on the grounds that investors interpret non-disclosure as a bad sign anyway and are thus not disadvantaged by it. As an alternative, public companies should be required to report quarterly, thus considerably reducing the need for short-term forecasts. Where forecasts are published, there should be a standard minimum information set, a statement of directors' responsibilities, akin to that now published for out-turn information, and better regulation of the assumptions used in producing the forecast.

Brennan's work is a small-scale empirical study, using semi-structured interviews to yield qualitative data, and, as such, it is soundly constructed and interesting. The report is well-written and clearly structured; the evidence is handled appropriately and the findings are effectively supported by quotations from the interviews and explicitly keyed to previous studies. The work offers a number of insights that should provoke further research. The report will also provide a useful model to be placed in the hands of research students contemplating a similar sort of study.

However, the size and nature of the sample undermine the validity of the findings as empirical generalisations (as opposed to a source of insights). Responses show a degree of ambivalence about various issues, such as whether companies do in fact disclose bad news even when there is no tactical advantage from doing so, in order to avoid being accused of suppressing it, and whether forecasts tend to be bullish to enhance the desired tactical effect or conservative to give the directors a margin of safety should they not be met. This in turn limits the force of the findings as a basis for policy recommendations. In particular, the conclusion that there is no need for mandatory disclosure of profit forecasts on the grounds that investors will interpret non-disclosure as bad news and thus not be disadvantaged is problematic, when there is evidence that non-disclosure may be attributable to the news being neither good nor bad, and no evidence that, if there is bad news, investors can know how bad.

B. A. Rutherford
University of Kent at Canterbury

Corporate communications: views of institutional investors and lenders, edited by *Pauline Weetman and Aileen Beattie.* The Institute of Chartered Accountants of Scotland, ICAS, Edinburgh, 1999, x + 119 pp. and **Business Reporting: The Inevitable Change?** edited by *Vivien Beattie.* The Institute of Chartered Accountants of Scotland, Edinburgh, ICAS, 1999. xiv + 133pp.

The Institute of Chartered Accountants of Scotland (ICAS) has a history of producing thoughtful discussion documents. Its current contribution is no exception. *Corporate Communications* and *Business Reporting*, two discussion documents, are presented very much as a linked pair. In *Corporate Communications*, interviews with institutional investors and lenders yield information about the current state of accounting. This information is then refined and developed in *Business Reporting.* The roots of this research stem from the Jenkins Report (American Institute of Certified Public Accountants, 1994) which examined the present state of US financial reporting. However, it also neatly ties in with interview studies by Holland (1997) and Marston (1996, 1999), who have also recently reported results of interview studies sponsored by ICAS. These discussion documents thus continue the valuable Scottish tradition of interview-driven research. Indeed, ICAS has established an impressive research niche in this area.

Corporate Communications is based on interviews with 14 expert users of business information: five fund managers and in-house analysts, four brokers' analysts and five bank lenders. Semi-structured interviews were conducted. Four key areas were addressed: the decision-making process, information needs, risk and uncertainty and the ideal information set. This section of the report provides interesting information to those concerned with the decision-making process and with analysts' information needs. For example, analysts prefer to develop their own analytical models. In one case, one lender used a risk-rating system based on 25-30 key variables.

A particular feature of this type of research is the occasional quotable gems one comes across. Three examples will suffice:

> 'About 60% to 70% of events surrounding a company are routine whereas the other 30% are unusual. The excitement of the investment process lies in the 30%' (fund manager's comments on decision-making, p.25).

> 'The finance director of Y Plc has never misled me and has always had a handle on all the numbers' (fund manager's comments on information needs, p.37).

> 'When we invest in a new company, we do a bit more detailed analysis but it is still the same figures that matter. Is the company growing? Is the balance sheet all right? Are margins sustainable?' (fund manager on risk and uncertainties, p.59).

Such quotations provide valuable insights into those wishing to understand users' needs and the investment process.

Four themes were distilled from these interviews. First, an annual cycle of communication which begins with the production of the annual report. Although criticised for its lack of timeliness, the annual report forms an important yearly event and reference point. Second, a problem of differential access covered by the one-to-one meetings which investment analysts increasingly have with management. These meetings are seen as crucial by the sophisticated investors, but potentially cause problems, especially given the UK's insider trading legislation. Third, the researchers were surprised to find a lack of concern with information overload. Sophisticated investors tended to be good at filtering information. Finally, the role of one-to-one meetings rather than external audit was found to be the key for creating and maintaining confidence.

Business Reporting sought to explore these four themes through a questionnaire and follow-up interviews. Out of 308 questionnaires, there were 154 responses (50%). These were spread over six groups: four user groups (21 corporate lenders; 29 fund managers; 19 investment analysts; and 14 small shareholders) and two preparer groups (29 financial advisors and 42 auditors). The 15 telephone inteviews comprised nine users and six preparers.

There were five main findings which, in the main, confirmed the findings of *Corporate Communications*. First, some dissatisfaction was found with information timeliness. Second, the belief that one-to-one meetings were beneficial, but created the perception of unfair advantage. Third, information overload was again not perceived to be a problem. Fourth, the relative importance of one-to-one meetings rather than audit in creating confidence was confirmed. Finally, the quality of management was established as the principal driver of company performance.

Having reviewed these findings, *Business Reporting* sets out seven forward-looking proposals: the creation of an electronic library type corporate database available to external users; the layering and linking of information so that users can extract customised information; pre-packaged information using standardised templates for each user group; extending access to company meetings by broadcasting general meetings live and by publishing minutes from one-to-one meetings; additional forward-looking, non-financial information, for example on intellectual capital and on directors' biographical details; more frequent library updates but not real-time reporting; and a move to assurance of information system processes rather than outputs. Rather than totally new proposals, this section should be taken as a synthesis of ICAS's recent work in this area. Finally, *Business Reporting* sets out a research agenda for the future calling for research into areas such as the monitoring of corporate business reporting practices.

These two reports, therefore, represent a significant attempt both to survey current views of financial reporting practice and to move forward. Overall, I find this attempt extremely creditable and exceedingly worthwhile. I do, however, have some concerns. First, the fact that both documents are produced together in February 1999 is perhaps unfortunate. Even more so when combined with Claire Marston's *Investor Relations Meetings: Views of Companies, Institutional Investors and Analysts* (ICAS, 1999), which is in the same broad area. The linked nature of the two ICAS reports causes some repetition, especially when the two are read sequentially. In part, this is an unavoidable consequence of summarising the findings for the casual reader. The main findings are repeated many times. If, for example, Appendix A which does a good, but selective, review of the literature was removed from *Corporate Communications* and the literature reviews and rationales of the two documents were combined, then we would have had one slightly larger report.

Business Reporting follows on from *Corporate Communications*. However, at times there seems to be discontinuities. For example, the drivers of cash and profit are first established in Chapter 3 of *Corporate Communications*. They are grouped into headings such as the national economy, product market, industry, the business of the company, quality of management and quality of assets (p.50). I therefore expected this structure to be used for the questionnaire survey in *Business Reporting*; instead, five slightly different generic factors emerge.

A degree of perspective needs to be kept when evaluating this research. Initially, in *Corporate Communications* 14 interviews were conducted in which to explore the issues. These were all expert users. In the second stage, *Business Reporting*, there is a mixture of expert users 69, inexpert users 14, preparers 29 and auditors 42. Are themes derived from expert users necessarily appropriate for framing questions to such a wide spread of both expert and inexpert users and of preparers? In addition, the wide spread of users and preparers means that the numbers responding fall to small sample size (i.e., less than 30) in all cases except the auditors. Some of the respondents also seem to be from the same institution. General conclusions and proposals, therefore, are derived from what in some cases are quite small sample sizes.

The discussion documents, on the whole, were well-presented. I particularly like the handy pocket-size format (ideal for train journeys). However, I found one aspect of the appendices of *Business Reporting* frustrating. The lack of a coding on the tables made a quick assimilation of the study's findings difficult. One had to hunt through the text to decode the keys.

I did wonder why the follow-up interviews were conducted. Comparatively little information was given in *Business Reporting* about their findings. This contrasts with *Corporate Communications*, which was really written around the exploratory interviews. Hopefully, the follow-up interviews will appear as an academic paper, as they undoubtedly contain much of value.

Overall, however, I can wholeheartedly recommend these two discussion documents. They are essential reading not only for academics interested in research in this area, but also more widely for all those who are interested in the current state and possible future developments in external financial reporting. ICAS is to be highly commended.

Cardiff Business School Michael John Jones

Investor relations meetings: views of companies, institutional investors and analysts. *Claire Marston.* The Institute of Chartered Accountants of Scotland, Glasgow, 1999. xi + 125 pp.

The 1990s have seen an increase of interest in all aspects of corporate communication. This study, building on earlier work, relates to the meetings (and telephone conversations) which are increasingly taking place between directors/managers of companies and institutional investors/analysts. This is clearly an important area, as concern has been expressed that price-sensitive information could be divulged during such private discussions. The approach of this study was to interview 10 directors/managers of FTSE-100 companies, six institutional investors and six analysts. The aims of the study were to explore current practices in organising investor relation meetings, to identify why these meetings are important and why they are held, to establish the topics covered in these meetings, and identify the perceived benefits and problems arising from such interactions. Included in the appendices is a useful outline of the current legal and regulatory framework relating to company announcements and insider dealing.

The three groups of interviewees considered that all types of investor relations meetings were important and that they had arisen to meet the market's needs. These discussions included the financial results, strategic issues and specific events such as takeovers. Not only did this enable the institutional investors/analysts to gain an insight in the running of the business, but companies also gained by receiving feedback and information about market sentiment. The main recommendations to come out of the study related to the increased transparency of the investor relations process, enhancing the timeliness and completeness of information for all classes of investors (including forward-looking information which was divulged in meetings) and suggestions for improving the impact of these meetings.

As such, the study provides a fascinating insight into this increasingly important area of corporate communication. Company directors obviously consider these meetings to be important—on average the participating companies held 52 one-to-one meetings during 1996/97 (p.18). As is pointed out (p.ix), this is a massive amount of management time. According to company respondents, one of the major benefits of investor relations meetings was that it gave the attendees 'the opportunity of assessing the calibre of management' (p.77) and '[g]enerally it was not considered that analysts gained a competitive advantage merely by having a meeting' (p.78). However, the danger is that one would expect these respondents to say these things. It is a pity that there is very little discussion of the steps taken to establish the validity of the data (i.e., the responses). One would have thought the latter was especially important in a study such as this, where a number of the company directors/managers are involved in investor relations, and thus would be expected to be adept at putting over the message they wanted to put over. Given this situation, at least the acknowledgement of a potential limitation of the data would have been warranted.

Although 'all participants were at pains to point out that price sensitive information was not discussed' (p.103), the reader may not be entirely convinced by this. It was stated that 'close periods [i.e.

that period immediately before the announcement of a company's results] were not maintained strictly by some companies' (p.56) and stock market efficiency was used to justify 'an incentive for managers to disclose inside information about what the forthcoming results are going to be' (p.45)! The suggestion that '[m]inutes would have to be edited in certain cases to preserve confidentiality' (p.ix) again implies that the institutional investors/analysts at these meetings may have an advantage over those who are excluded. This does raise a corporate governance issue (p.44); however it is problematic whether increasing transparency in investor relations can really be the answer. Even the ex-post release of minutes (including via the internet) would surely leave non-participants at a disadvantage. After all, timing is crucial in terms of potentially price sensitive information.

It was considered that '[i]mage, reputation and impressions are important attributes which can be enhanced through the meetings' (p.44). Company representatives considered that these meetings were 'an opportunity to sell the company' (p.87) and 'that they helped the share price to reflect the true value of the company by enabling all public information to be better understood by analysts and institutions' (p.88). Interestingly, an institutional investor 'was of the opinion that share prices of poor communicators had been "getting hammered recently"'. (p.92). One implication could be that directors may feel that they are able to talk up their share price. This could help to explain their willingness to participate in so many one-to-one meetings and their reticence for group meetings. A comparison of the share performance of communicating companies versus non-communicating companies could make for an interesting (though difficult) study.

Perhaps more could have been said about the nature of the 'one-to-one' meetings—an interesting insight might have been obtained regarding the ambiance of these meetings. Were these business-like mid-morning meetings or casual lunchtime encounters? Implied in the study were presentations by the company management, but equally they could have taken the form of informal discussions. The way things are said is often as important as what is said. Though this should not have an impact on share price, it would have added to the overall picture.

In the foreword to the study it was stated that 'capital markets have become more sophisticated'. It would probably be better for a researcher to keep an open mind on this and then provide evidence to either support or attack this hypothesis. It is problematic whether the evidence presented necessarily indicates an increase in sophistication in the operation of the capital markets.

The study gives rise to a host of questions and the reader is left to wonder about the implications of its findings—which, of course, is a good thing. This is clearly an area worthy of further study; however, the difficulty of obtaining relevant data should not be underestimated.

Loughborough University Andrew Higson

Guide for Authors

General

Papers should be in English and consist of original unpublished work not currently being considered for publication elsewhere. They should be typed and double-spaced. *Four* copies should be submitted, together with a submission fee of £18 for subscribers or £36 for non-subscribers. In order to ensure an anonymous review, authors should not identify themselves, directly or indirectly. Experience has shown that papers that have already benefited from critical comment from colleagues at seminars or at conferences have a much better chance of acceptance. Where the research takes the form of field surveys or experiments, *four* copies of the instrument should be submitted. Where the paper shares data with another paper, *four* copies of the other paper must also be provided.

Presentation

A cover page should show the title of the paper, the author's name, title and affiliation, and any acknowledgements. The title of the paper, but not the author's name, should appear on the first page of the text. An abstract of 150–250 words should be provided on a separate page immediately preceding the text. Section headings should be numbered using Arabic numerals.

Tables and figures

Each table and figure should bear an Arabic number and a title and should be referred to in the text. Sources should be clearly stated. Sufficient details should be provided in the heading and body of each table and figure to reduce to a minimum the need for cross-referencing by readers to other parts of the manuscript. Tables and figures should appear at the end of the paper, with its most appropriate placing noted in the paper itself. Diagrams and charts should be submitted in camera-ready form.

Footnotes

Footnotes should be used only in order to avoid interrupting the continuity of the text, and should not be used to excess. They should be numbered consecutively throughout the manuscript with superscript Arabic numerals. They should not be used in book reviews.

References

References should be listed at the end of the paper and referred to in the text as, for example, (Zeff, 1980: 24). Wherever appropriate, the reference should include a page or chapter number in the journal or book in question. Only works cited in the paper should be included in the list. Citations to institutional works should if possible employ acronyms or short titles. If an author's name is mentioned in the text it need not be repeated in the citation, e.g. 'Tippett and Whittington (1995: 209) state...'

In the list of references, titles of journals should omit an initial 'The' but should not otherwise be abbreviated. The entries should be arranged in alphabetical order by surname of the first author. Multiple works by the same author should be listed in chronological order of publication. Some examples are:

Accounting Standards Steering Committee (1975). *The Corporate Report.* London: ASC.

Tippett, M. and Whittington, G. (1995). 'An empirical evaluation of an induced theory of financial ratios'. *Accounting and Business Research*, 25 (Summer): 208–218.

Watts, R. L. and Zimmerman, J. L. (1986). *Positive Accounting Theory.* Englewood Cliffs, NJ: Prentice-Hall.

Style and spelling

Abbreviations of institutional names should be written as, for example, FASB and not F.A.S.B; those of Latin terms should contain stops (thus i.e. not ie). Words such as 'realise' should be spelled with an 's' not a 'z'. Single quotations marks should be used, not double.

Mathematical notation

Mathematical notation should be used only where it adds rigour and precision, and should be properly explained in the text. Equations should be numbered in parentheses, flush with the right-hand margin.